

COMPUTERWORLD

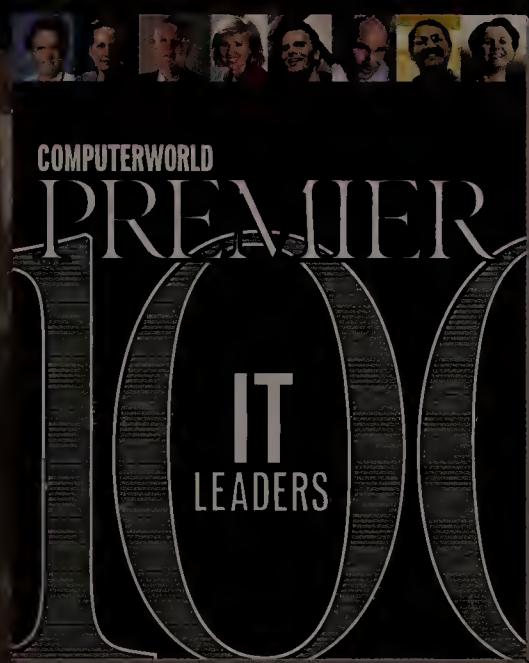
THE NEWSPAPER FOR IT LEADERS • WWW.COMPUTERWORLD.COM

MAY 8, 2000 • VOL. 34 • NO. 19 • \$4 COPY

Now You Have **2 New Tools** to Boost Your IT Leadership Skills:

In this issue.

This issue of Computerworld reveals the results of our extensive research to identify the Premier 100 IT Leaders. In this special section, you'll see how these Fortune 1000 IT executives have become outstanding practitioners and early adopters of leading-edge IT.



COMPUTERWORLD **100** PREMIER IT LEADERS CONFERENCE

June 19-21, 2000
Marriott Desert Springs
Resort & Spa
Palm Desert, CA

At this conference.

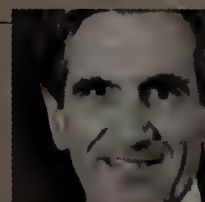
At Computerworld's Premier 100 IT Leaders Conference, June 19-21, 2000 at the Marriott Desert Springs Resort & Spa, you'll meet and learn from the finest leaders in IT today — those honored as Computerworld's Premier 100 IT Leaders. Since many who will attend and present will be those honored as "the 100," you'll see early adopters of technology and business-savvy executives who excel at leveraging strategic information resources.

Premier 100 IT Leaders Conference

Speakers Include:

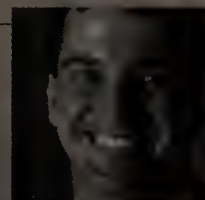
Delta Airlines

E-Leader and former CIO
Charlie Feld



Raytheon

E-Business Director
Eric Singleton



Cambridge Technology Partners

VP of Research
Thornton May



Toysmart.com

CEO
David Lord



Cisco Systems

CIO
Peter Solvik



Autobytel.com

COO
Ann Delligatta



Ford Motor Company

VP/CIO
James Yost



Keen Education

Chairman
Peter Keen



For more information or to register call 1-800-343-6474 x8529
or visit www.computerworld.com/p100
and see more details on the inside front cover

CONFERENCE AGENDA

Learn IT Leadership from the Best in the Business!

COMPUTERWORLD 100 PREMIER IT LEADERS CONFERENCE

June 19-21, 2000
Marriott Desert Springs
Resort & Spa
Palm Desert, CA

At Computerworld's Premier 100 IT Leaders Conference, June 19-21, 2000 at the Marriott Desert Springs Resort & Spa, you'll meet and learn from the finest leaders in information technology today. Since many who will attend and present will be Computerworld's Premier 100 IT Leaders – Fortune 1000 IT executives honored by Computerworld as outstanding practitioners of leading-edge IT – you'll see early adopters of technology and business-savvy executives who excel at leveraging strategic information resources.



74855 Country Club Drive
Palm Desert, CA 92260
USA
Call 1-800-331-3112
for hotel accommodations.

Sunday, June 18, 2000

12:00pm - 5:00pm

Registration

7:00pm - 9:30pm

Pre-Conference Networking Reception

Monday, June 19, 2000

8:30am - 9:00am



Welcome and Opening Overview
Maryfran Johnson, Editor-in-Chief
Computerworld

9:00am - 9:45am



Opening Keynote: "IT Leadership vs. E-Leadership"
Charlie Feld, E-Leader and former CIO, Delta Airlines
CEO, The Feld Group

10:00am - 11:30am



"The Naked Truth About B2B E-Commerce"
Kevin Fogarty, Business Editor
Computerworld

Moderator

Panelists:

Robert Schwartz, VP & GM
Panasonic Corp.

Kathy Brittain-White, CIO & EVP
Cardinal Health (cardhealth.com)

Peter Burrows, CTO
Reebok International

John Keast, CIO/CTO
NetworkOil

Bruce Carver, VP of International
Management and Technology
Reynolds & Reynolds

Everybody's talking about business-to-business collaboration as the hottest of the online trends in 2000. But many feel this emperor still has no clothes. This panel will cut through the hype surrounding e-marketplaces, answering some critical questions on the benefits versus the risks. Should your company participate in someone else's B2B marketplace or create your own? When and how do you measure ROI when you're executing at Internet speed? There are multiple decision points for entry into Web-based collaboration, including infrastructure concerns, business application readiness and trust issues between trading partners. As these new business and organizational models evolve, what are the key factors your company must consider? Can it really promote higher sales or lower your production costs? IT leaders from several industries will share their successes and candidly discuss the pitfalls of B2B e-commerce in this interactive session.

11:30am - 12:15pm



Insider View: "Raytheon Corp.'s Unfolding E-Business Strategy"
Eric Singleton, Director of Global E-Business
Raytheon

12:30pm - 1:45pm

Interactive Luncheon with IT Leaders

2:00pm - 3:30pm



"Enterprise Security: Will Only the Paranoid Survive?"
Priscilla Tate, President
Technology Managers Forum

Moderator

Panelists:

Scott Charney
former head of computer crime
investigations, U.S. Department
of Justice and now Partner
PricewaterhouseCoopers

Allan Paller
Columnist, Computerworld
and Research Director, SANS

Tim Talbot, VP of Technology
Management, PHH Vehicle
Management Service

The costs of electronic attacks and security breaches are rising sharply, more than doubling each year into hundreds of millions of dollars. Every week, it seems, a new high-profile victim joins the list of companies that failed to protect themselves and their customers. Never have the business imperatives of secure commerce been so prominently in the spotlight. For IT leaders, the issues go beyond technical concerns. What are your company's legal liabilities when customer data is compromised? How do you get past political wrangling over budget allocations for security products? What are the questions you should be asking inside your own company – or of your outsourcers or suppliers? This session will explore enterprise security in depth, drawing out examples, ideas and action items from our expert panelists.

3:30pm - 4:15pm



Afternoon Keynote: "Innovation & Change"
Thornton May, VP of Research
Cambridge Technology Partners

4:30pm - 5:30pm

**Premier Sponsor Breakout Session 1
Palm Mobile Solutions Session**

5:30pm - 8:30pm

Expo Open and Reception/Buffer Dinner

Tuesday, June 20, 2000

8:45am - 9:00am

Remarks and Day Two Overview

9:00am - 9:45am



Keynote
David Lord, CEO
Toysmart.com

10:00am - 11:30am



"ASPs: The Double-Edged Sword of Outsourcing"
Mark Hall, West Coast Bureau Chief
Computerworld

Moderator

Panelists:

Olck Hudson, CIO
Global Marine

John Voeller, CIO, CTO & SVP
Black & Veatch

Sateesh Lele, President
Lele Consulting Group

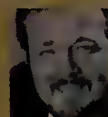
Tsvi Gal, CIO, CTO & VP of Mergers
and Acquisitions, GBS

Mark Mathias, President
Eureka Digital

James Lubinski, EVP
Galileo International

This latest trend is both an option and an obstacle. As the application service provider market grows beyond the small to medium business space to take advantage of enterprise-class software, IT leaders are considering ASPs as a serious tool in their technology strategies. Yet will these outside vendors offer sufficient security for your IT operations? Can you control point product offerings from ASPs? How do you insure that ASPs deliver on service level agreements? Will today's high-flyers crash to earth and take your company with them? This panel session will nail down the critical success and failure points, and answer the most pressing and provocative questions that ASPs raise for IT executives.

11:30am - 12:15pm



Featured Speaker
Peter Solvik, CIO
Cisco Systems

12:30pm - 2:00pm

Buffet Lunch and Expo Open

2:00pm - 3:30pm



"Walking the E-Customer Tightrope"
Julia King, Senior Editor
Computerworld

Moderator

Panelists:

Cathy Hotka, VP
National Retail Federation

Joseph Smialowski
Vice Chairman
Fleet Boston Financial

Robert Rubin, CIO
Elf Atochem North America

Manoj Tripathi, CIO and Vice President
Jamba Juice

Technologies such as data mining and customer relationship management software can put your company right in its customers' pockets, not only anticipating their current needs but discovering new ones. But where does e-business cross over that line between customer knowledge to invasion of privacy? Does your company know how to walk this tightrope without falling off? What are the best strategies for leveraging and managing high-impact business data without alienating customers along the way? How are leading companies using technology to sustain old relationships while developing lucrative new ones? Does online customer service differ from the traditional approach? This panel session will explore the possibilities and the perils of the customer connection.

3:30pm - 4:15pm



Insider View: "Taking Care of E-Customers at Autobytel"
Ann Delligatta, COO
Autobytel.com

4:15pm - 5:15pm

Premier Sponsor Breakout Sessions 2 and 3

5:15pm - 7:00pm

Expo Open and Reception

7:00pm - 9:00pm



Premier 100 Awards Presentation and Gala Dinner
Featured Keynote: Jim Yost, CIO
Ford Motor Company

Wednesday, June 21, 2000

8:45am - 9:00am

Remarks and Closing Day Overview

9:00am - 10:30am



"How to Win the Hiring War Between the 'Dots' and the 'Nots'"
David Weldon, Careers Editor
Computerworld

Moderator

Panelists:

Irene Dec, VP of International
Investments, Prudential Insurance Co.

Margaret Schweer, HR Director
Kraft Foods

Robert Bruce, CIO
Allmerica Financial

David Foote, Managing Partner
Foote Partners LLC

Jim Prevost, CIO
Green Mountain Coffee

Fran Quttel, Columnist
Computerworld

Many traditional companies are reeling from the impact of the dot-com drainpipe, as sexy little startups pull top talent from their employment ranks. Beyond the stock options and the thrill of new ventures, what are dot-coms offering that your company may be overlooking? Are you talking about career development, or droning on about employee retention? How can you "steal" from your own staff in other divisions to enrich and strengthen the technology operation? What kind of employee referral programs really work? We'll hear from both sides of the debate in this lively, provocative discussion of hiring, head-hunting and holding onto the best IT people in a sizzling job market.

10:30am - 11:15am



Closing Keynote: "Putting All the Pieces Together: The E-Management Difference"
Peter Keen, Author, *The eProcess Edge*, and Chairman
Keen Education

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THE BEST DEFENSE . . .

Businesses are quickly learning how to protect themselves on the Web. Hear from the experts on what to watch out for (page 52), as well as how to build Web privacy policies for customer data (page 57).

THE CULTURAL DIVIDE

How do you merge the IT departments of two established industry giants? AlliedSignal and Honeywell pulled it off in six months. Page 42

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BLOATED FILE SIZE AN ISSUE FOR XML

*IT must plan servers,
networks accordingly*

BY CAROL SLIWA

United Parcel Service of America Inc. plans soon to launch a beta project using XML to exchange shipment, tracking and rate information with select business customers.

But XML file size is a looming issue. The carrier manifest, one of the largest files the Atlanta-based company receives via electronic data interchange and Internet-based data streams, is now no more than 100MB in size.

However, UPS discovered

that comparable XML files could be nearly three times as large — which will influence the infrastructure decisions the carrier makes in the near future, said Augie Picado, director of e-commerce deployment.

"The size of files is a key consideration," Picado said. "It's something that we have to plan for."

Picado said he doesn't think bloated files will derail adoption of the content-tagging language, nor do many other users, industry analysts and consultants.

But they cautioned that file size is one of the many issues companies must take into account as they set up networks, storage and servers to handle large volumes of XML documents. For example, companies that use dial-up

XML, page 16

**B-TO-B
ISSUES**

IT IN CROSSHAIRS OF VIRUS, ATTACKS

*'Love Bug' spotlights
misuse of VB script*

BY ANN HARRISON

Companies around the world scrambled to purge the "I Love You" e-mail worm and follow-on variations from their systems last week in a hoax that surpassed the Melissa virus in scope, infecting 1 million computers, according to one security firm.

The havoc caused by the virus — clogged e-mail systems, communications stalled by servers taken off-line for inspection or the possible theft of passwords from infected

'Love Bug,' page 111

*New weapon bolsters
crackers' arsenals*

BY JAIKUMAR VIJAYAN

A respected computer security authority sounded the alarm last week about a new tool that crackers could use to launch Web site attacks similar to the lethal ones that brought down several sites in February.

Experts said there is little that administrators can do to prevent such distributed denial-of-service attacks, so the key is to be prepared to deal with the problem quickly to mitigate damage.

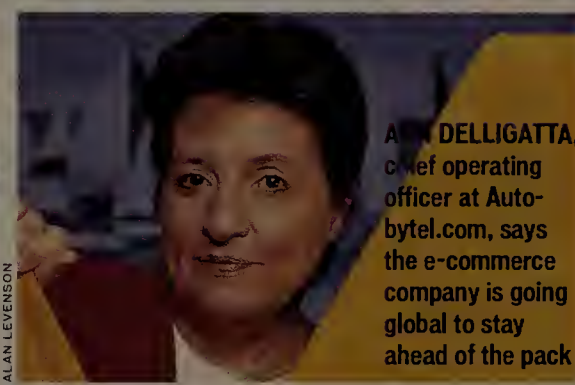
"Prevention isn't the issue so

New Weapon, page 111



PREMIER

100 IT LEADERS



AMY DELLIGATTA,
chief operating
officer at Auto-
bytel.com, says
the e-commerce
company is going
global to stay
ahead of the pack

WHAT SEPARATES THE REAL LEADERS FROM EVEN THE BEST IT MANAGERS? *Computerworld* undertook an ambitious, groundbreaking effort to identify 100 top IT people who met our leadership criteria — and then to figure out what makes them tick. We learned how they handle setbacks and manage the risks of selecting bet-the-business technologies. We saw how they nurture their IT staffs and identify future talent. And we came away impressed with their role as business strategists, not just technology strategists. We call them the Premier 100 IT Leaders.

Special supplement begins after page 56.

Also: Check out our extensive Web package of leadership stories, resource links, discussion forums and even a leadership cartoon at www.computerworld.com/premier100

AUTO EXCHANGE HITS POTHOLES

*Parts suppliers aren't
buying Big Three's line*

BY LEE COPELAND

Major automakers are driving hard to channel \$240 billion worth of procurement transactions through a still-unnamed business-to-business exchange formed two months ago. But according to a new study, key automotive suppliers see a pothole-filled road ahead for the automakers, and streets paved

with gold for the technology firms hired to set up the online purchasing exchange.

According to a survey of 19 large auto-parts suppliers released last week by Merrill Lynch & Co. in New York, suppliers contend that the planned Internet marketplace, tentatively called Newco, will take at least a year to get in gear because of the contractual complexities inherent in the collaboration of competitors [News, March 6].

And while the automakers are promoting the exchange as beneficial to the parts suppliers, who are being encouraged to channel their own procure-

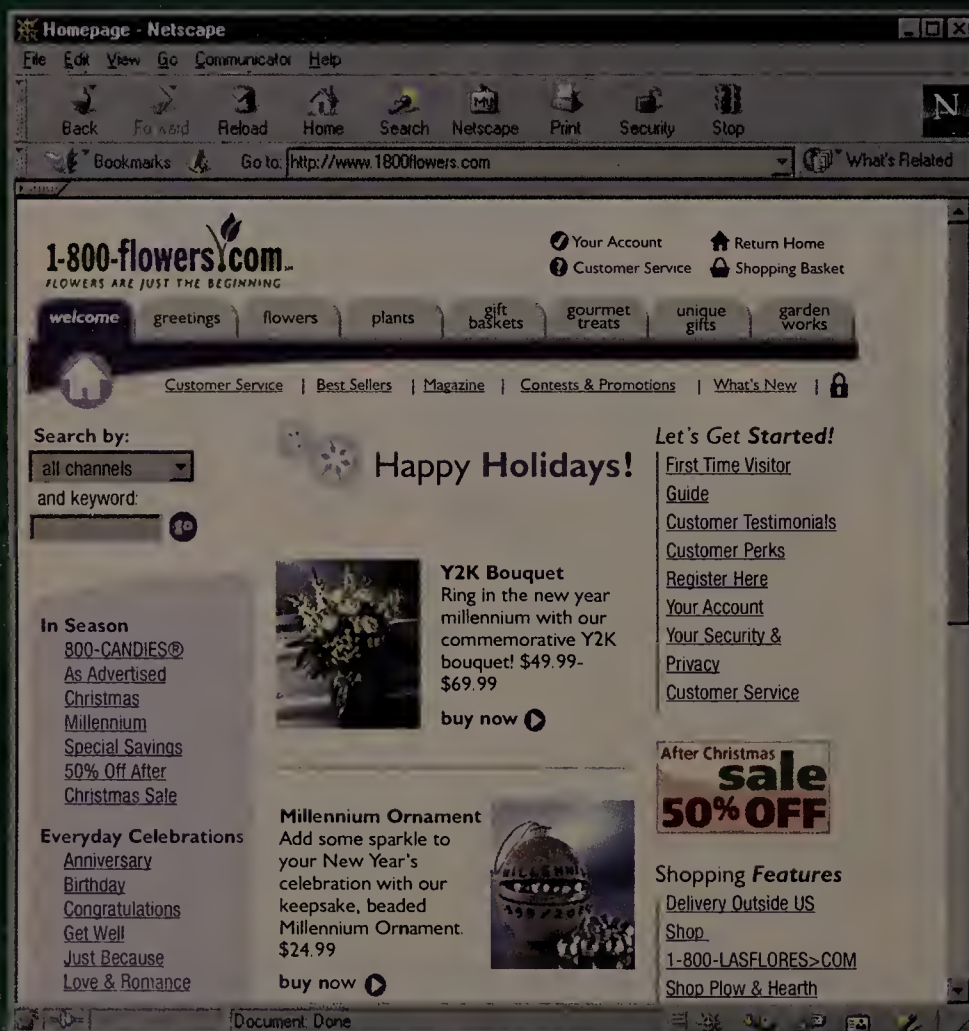
ment through the exchange, the suppliers aren't toeing that line. The exchange won't improve their profit margins overall, the suppliers said.

Auto Exchange, page 16

Auto Marketplace 'To Do' List

- Get an official name and URL
- Find a CEO
- Reach a definitive agreement with OEM participants
- Await seal of approval from Federal Trade Commission

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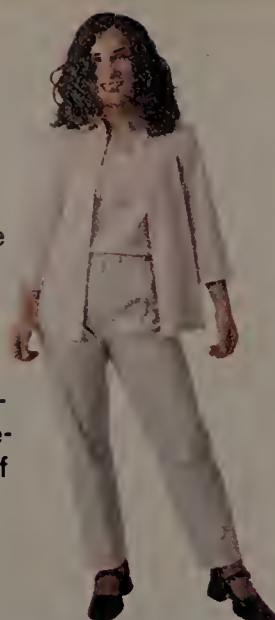
Retail e-commerce may be pervasive, but a recent *Computerworld* survey suggests that many companies' Web sites, even those of large firms such as OshKosh B'gosh, are relatively small and not technically complex. However, they still face the same technical bottlenecks that much larger systems do. Page 80



JAMES SCHNEPP

DRESS FOR SUCCESS

Having trouble trying to strike a balance between business and casual? The fashion experts at CandoWoman offer tips on how to dress for IT success, and they illustrate that advice with "before-and-after" makeover shots of Scott Barnett and Sabrina Hague, graphic designers at Umagic Systems in New York. Page 58



CHRISTOPHER LUPPOLA

COMPUTERWORLD THIS WEEK

MAY 8, 2000

NEWS

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- 8 LINUX IS BOMBARDED** with bad news as LinuxCare withdraws its IPO and the release of Linux 2.4 is delayed.
- 12 FCC POSTPONES** auctions of next-generation wireless spectrum from June until September.
- 14 COMPANIES SHOULD** move to managed desktop environments to reap the full rewards of Windows 2000, says an analyst.
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- 28 APL SPEEDS** truck cargo loading with automated, wireless tracking system.

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- 52 COMPANIES FACE** high stakes as they are bombarded by today's sophisticated technology security threats.
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- QUICKSTUDY**
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- 33 JOSEPH G. MORONE** says the government's assault on Microsoft constitutes an attack on a paragon of strategic man-

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- SECURITY JOURNAL**
- 74 PAT SOAKS UP** some neat tips about security threats via TCP/IP and your domain controllers.
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- 78 SEARCH ENGINES** and how they work to help users navigate the Web are the subjects of this week's primer.
- 82 OPEN-SOURCE** software spirited into non-open-source shops for specific jobs often works well but can be a maintenance-and-support headache.

COMPUTERWORLD 100 PREMIER IT LEADERS

Visit www.computerworld.com/premier100 for our complete online package of leadership stories, resource links, discussion forums, leadership quotes and fun trivia. Also, check for upcoming coverage of *Computerworld's* Premier 100 IT Leaders Conference, June 19-21, in Palm Desert, Calif.

agement and U.S. industrial competitiveness.

- 36 ALLAN E. ALTER** says strategy and flexibility are the twin hallmarks of IT leadership today.
- 36 THORNTON MAY** launches a counterattack on the latest group to verbally assault CIOs: "privacy protectors."

- 50 PETER G. W. KEEN** says he believes that with the growth of e-commerce, IT must again make business processes central to its work.
- 112 FRANK HAYES** says corporate IT must always be on guard against the workings of monopolies.

AT DEADLINE

Sun Reorganizes for Customer Focus

Sun Microsystems Inc. will reorganize its operations to better focus on the needs of customers, the hardware and software maker announced last week.

The moves, which will take effect July 1, include establishing a customer advocacy function to watch over companywide product quality and availability.

MicroStrategy Restates Earnings

MicroStrategy Inc. last week restated its quarterly financial results for last year, leaving the once high-flying maker of data analysis software with losses in each of 1999's four quarters. The Vienna, Va.-based company had already restated its results for last year, saying three weeks ago that last year's total revenue was being adjusted from \$205.3 million to \$151.3 million.

Users Ask Microsoft To Slow App Releases

The year-old Microsoft Manufacturing User Group (MS-MUG) wants the software giant to slow the introduction of new software releases affecting real-time manufacturing controls. Manufacturers can't afford to shut down plants to deploy a new operating system or service pack every time Microsoft Corp. releases an upgrade, members of the MS-MUG said in interviews last week.

Short Takes

The **NEW YORK MERCANTILE EXCHANGE** board of directors announced that it approved a new Internet-based commodities exchange that will initially focus on electronic trading of crude oil, petroleum products, natural gas and electricity. . . . Nathan Myhrvold, **MICROSOFT's** chief technology officer, who took a sabbatical last year to pursue other interests, will act as a part-time special adviser to Bill Gates. . . . Enrico Pesatori has left **COMPAQ COMPUTER CORP.** to take over as president and CEO of server vendor **SYNAXIA NETWORKS CORP.**, which has yet to release a product.

Communications Failure Halts Railroad

Routine maintenance by MCI WorldCom causes major disruption for CSXT

BY JAMES COPE

RAIL TRAFFIC in 19 states began to return to normal last week after being brought to a standstill by an MCI WorldCom Inc. outage caused by what the carrier said was routine maintenance.

The telecommunications outage, which lasted about six hours on April 28, stopped hundreds of trains on the tracks and disrupted rail traffic throughout Jacksonville, Fla.-based CSX Transportation Inc.'s (CSXT) system. It was, according to one analyst, the kind of single-point-of-failure problem that comes with dependence on public broadband systems and one that could bring almost any big company to its knees.

CSXT spokeswoman Kathy Burns said late last week that she anticipated that the rail system would be operating normally by last Friday. Both passenger and freight delays were experienced much of the week as far north as Chicago, though she couldn't quantify the impact on rail customers.

"Some trains didn't move for six and a half hours," Burns said.

Immediate Action

MCI WorldCom spokeswoman Linda Laughlin in Clinton, Miss., said the outage occurred during routine maintenance of a digital access cross-connect system (DACS) in Jacksonville. Technicians were updating addressing information in the equipment, which served CSXT and other customers, when the problem occurred. "We were aware we had a problem at 4:25 a.m. and immediately notified CSXT," Laughlin said.

The DACS includes computer-based devices that route voice and data traffic over public telecommunications networks, based on circuit ad-

ressing information carried by the signals, according to Steve Oliva, manager of transport planning at Sprint Corp. in Kansas City.

Telecommunications analyst David Willis at Meta Group Inc. in Stamford, Conn., said that what the MCI technicians were doing was technically pretty simple.

But he said he was troubled that "this fairly minor change affected CSXT for several days."

Noted Willis, "You would expect better change-control processes [from MCI WorldCom]. They have been bitten by change processes before in the 1999 [frame-relay] outages." Those outages knocked

out communications at the Chicago Board of Trade last August [News, Aug. 13].

Laughlin said she agreed that this did involve change processes but stressed that it wasn't a frame-relay issue. She said MCI passes on lessons learned from any incidents to its technicians worldwide.

All of CSXT's systems — including voice, data, signaling and radio communications — were affected by the outage.

In a joint phone conference with *Computerworld* late last week, CSXT and MCI officials said they were teaming up to analyze the reliability of CSXT's telecommunications system. The use of more access points or even additional carriers are options being considered, Burns and Laughlin said.

Willis said it's "going to get a lot scarier" for large corporations that rely on current pub-

WHAT HAPPENED?

Outage Stops Trains on Tracks

A total communication outage occurred at 4:30 a.m. on April 28; most communications were restored by 11 a.m. that day

The outage was caused by the failure of a digital access cross-connect system during routine maintenance

It disrupted all data and voice communications, including train signaling systems and two-way radio communications between trains and CSXT dispatch

A joint team from CSXT and MCI WorldCom is trying to determine best approach to eliminate single-point-of-failure problems in the future

lic broadband infrastructures. In some instances, he said, the options for falling back on another system either don't exist or are limited to narrowband backups.

There is one solution, Willis said, and that's to use multiple carriers or carriers that can provide parallel infrastructures. But that can double the cost. Most large companies have been unwilling to pay up, he said. ▀

Web Development Tops Skills in Demand

Networking close behind, survey finds

BY JULEKHA DASH

Web development expertise now ranks as the most sought-after skill in information technology departments, outpacing networking for the first time, according to a survey of 1,400 CIOs at companies with at least 100 employees.

However, networking was just two percentage points behind in the survey by RHI Consulting Inc. in Menlo Park, Calif. Some 21% of the CIOs said networking was the fastest-growing skill area in their departments; 23% said Internet or intranet development skills were the fastest. (For the complete survey results, see "Hot Jobs in IT," page 66.)

RHI has been conducting the survey on a semiannual basis for four years.

That the numbers for networking and Web development were so close didn't sur-

prise John Kendzior, an IT recruiter at Harvard University. Kendzior said he expects to hire 12 to 15 network or systems administrators, plus a similar number of Web developers.

Michael Boyd, an analyst at International Data Corp. in Framingham, Mass., maintained that networking and Internet skills are so closely intertwined that it's difficult to separate them.

"How can you develop a Web server capability without having a pretty good understanding how it's going to interact over the Internet and internal networks?" he said.

Internet Skills Pervade IT

Boyd added that Internet skills pervade virtually every area of IT. "There aren't any IT jobs that I'm aware of where you don't have to have some kind of Internet skills," he said.

Barbara Gomolski, research director at Gartner Institute Inc. in Eden Prairie, Minn., said the type of networking experience employers seek these

days is, in fact, Web-related. This experience includes load-balancing and network security skills, she said.

The Web skills employers need most are integration abilities, said Gomolski. "A lot of companies have built Web sites but didn't connect [them] to existing systems," she said.

Integration skills have become crucial with the emergence of Web marketplaces and other business-to-business sites, said Gomolski. These portals are "complicated because they have to build detailed back ends. There's a lot of research going into developing [business-to-business] market sites. They're labor-intensive projects," she said.

The good news, said Gomolski, is that IT workers who have fourth-generation language or other experience developing graphical applications in a client/server environment can typically be easily retrained to develop applications in Java or another Web development environment. ▀



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Microsoft Fallout Dawning on Users

Many are now thinking about the ultimate impact of the company's antitrust case

BY PATRICK THIBODEAU
WASHINGTON

IT WAS TWO YEARS ago this month that the government filed its lawsuit against Microsoft Corp., and many users interviewed at the time said the trial had little importance in relation to their jobs. It was way off their radar screens.

But that's changing.

Users of Microsoft's products are beginning to consider how the trial and the government's plan to split the company in two may affect them.

"I can tell you categorically that we, the user community, are going to suffer in the first few years" if the proposed breakup actually occurs, said Enrique Crespo, global messaging manager at Ingersoll-Rand Co. in Woodcliff Lake, N.J. "The worst part is going to be this whole issue of integration."

Despite his contention, Crespo said he supports the government's plan to split Microsoft's applications — including its Web browser, developer tools and servers — from its operating system business. And it may be a "positive thing" for competition, he added.

On Wednesday, Microsoft will file its rebuttal to the government's "radical and overreaching proposal," said company spokesman Jim Cullinan. The company's brief will ask for the opportunity to examine issues raised by a breakup, he said. Microsoft isn't spelling out what it will seek, but legal experts expect the company to ask for new witnesses and evidence to argue its case.

It may take several months or more before the judge imposes a remedy. Appeals will follow. The case could conclude within a year if it is sent directly to the Supreme Court; otherwise, it may take several years. In the meantime, users are questioning what the ultimate fallout will be.

Andy Balazs, vice president

of information systems and services at Cleveland-based Medical Mutual of Ohio, said he doubts the value of a breakup.

"I just don't [see] where I'm better served in having one more salesman in my office and having one more company to deal with," said Balazs. "I don't see where it makes my job as an IT buyer any easier."

Even if a breakup leads to more competition, that doesn't change the economics of information technology purchasing, said Balazs.

"My cost of conversion [to non-Microsoft products] is way higher than the benefit of conversion," said Balazs. "If

you start out as a full Microsoft shop, you probably wouldn't spend the money to convert."

A key concern is how a breakup would affect application integration. Ashok Bakhshi, manager of application systems at Schindler Elevator Corp. in Morristown, N.J., argues that even if users are forgoing best-of-breed software in some cases when they use Microsoft products, it's a trade-off worth making.

"I believe that it doesn't have to be best-of-breed in everything; a lot of times, simplicity and integration [are] more powerful than best-of-breed," Bakhshi said.



A LOT OF TIMES, simplicity and integration [are] more powerful than best-of-breed, says Ashok Bakhshi at Schindler Elevator Corp.

The impact of any breakup on IT as a whole will be minimal, according to some users.

"I think the remedy is going to produce two big gorillas instead of one big gorilla," said Michael Redman, IS director at Nicholson Manufacturing Co. in Seattle. And a breakup isn't going to change the pace of innovation in the high-tech in-

dustry, argued Nancy Bauschinger, information systems director at Fidelity Insurance Service in Berkeley, Calif.

"Innovation is going to happen in this world, because we're all driven by curiosity. It's going to happen no matter what," said Bauschinger. "Microsoft is not driving innovation in the world of technology."

But Jerry Richards, vice president of systems at Wausau Insurance Cos. in Wausau, Wis., said he worries that users could be affected if the court case distracts Microsoft from its internal product development.

"I would be more concerned that it would freeze or delay a lot of the progress that has been made around NT and Windows," said Richards, who said he disagrees with the government's position in the case. ▀

Digital-Signature Legislation Expected by End of the Year

Big-ticket items like mortgages, cars hang in balance

BY PATRICK THIBODEAU
WASHINGTON

Congressional action on some high-tech-related issues, such as H-1B visas and Internet taxation, has been advancing slowly. But one piece of legislation that's nearing the finish line is a digital-signatures bill.

Contentious consumer-protection issues — such as determining what types of notifications can be sent electronically — still need to be resolved before digital signatures can gain the same legal status as written ones. But last week, a key Republican lawmaker and a U.S. Department of Commerce official both predicted the legislation would be approved.

"Were going to get it done by the end of the year, even if we have to settle for half a loaf,"

said U.S. Rep. Tom Davis (R-Va.). "We're not going to let this die."

If an agreement on digital-signature legislation isn't reached, the impact will depend on the type of financial transaction being conducted.

"I can buy and sell stocks online today without a digital signature. I can pay bills without a digital signature," said Bill

Bradway, an analyst at Meridian Research Inc. in Newton, Mass. It's the big-ticket consumer purchases such as mortgages and automobiles that can't be easily finalized online without digital-signature legislation, he added.

The companies that would be hurt most by the lack of a consistent national legal standard are those in financial services, where digital signatures need to have the same legal validity as written ones in order to execute financial contracts online.

Digital signatures can play an important role in further

advancing business-to-business e-commerce, said Bradway. But there are also alternative technologies available to authenticate customers, such as smart cards and biometrics.

Stamps Continue

But the absence of national legal recognition for digital signatures hasn't stopped Stamps.com Inc. from issuing stamps via the Internet.

Craig Ogg, chief technologist at the Santa Monica, Calif.-based firm, said the company uses digital signatures to authenticate customers. It uses the technology to establish customer identity through financial checks and conducts all of its business online.

Ogg said a federal law is needed to supersede actions being taken by several states to approve digital signature measures that would establish different standards for areas such as security. "One of the things a federal standard would do is set a minimum bar [for security] that you need to meet," he said. Because of its agreement with the U.S. Postal Service, Stamps.com follows rigid security standards in protecting digital-signature information. ▀

Clinton Privacy Plan

President Clinton recently added his own privacy plan to the mix, seeking greater protections on financial privacy beyond what was approved in last year's financial modernization bill:

CONSUMER CHOICE: Companies would have to seek consumer consent before they could share financial information with affiliates and third parties. Consent would also be needed to share medical information within a financial conglomerate.

ACCESS: Customers would have the right to review information and correct errors.

ENFORCEMENT: The U.S. Federal Trade Commission would enforce privacy rules and have the ability to seek monetary damages from violators.

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BRIEFS

Online Trading Jumps

The online brokerage industry surged in the first quarter, gaining more than 2.5 million accounts and rising 69% in trading volumes from the previous quarter, according to a report issued by U.S. Bancorp Piper Jaffray Inc. in Minneapolis. Assets also grew impressively, rising 23.5% from last quarter to more than \$1 trillion. Charles Schwab & Co. in San Francisco held on to the top spot, followed by ETrade Group Inc. in Palo Alto, Calif.

Read My Bits:
No New Taxes

The U.S. House Judiciary Committee voted last week to extend the ban on new and discriminatory Internet taxes by five years. The ban, established by the Internet Tax Freedom Act, was set to expire in October next year. The new bill, called the Internet Non-Discrimination Act, extends the ban to October 2006. The vote was 29 to 8. The full House may vote on the act this week.

Congress Drops
Database Protection

U.S. Rep. Tom Davis of Virginia, one of the Republican party leaders on technology issues, said last week that database protection legislation won't be approved this year. The legislation would protect databases from businesses that copy and then resell the contents as their own. But various proposals on the database protection issue have divided the industry, "and I just don't see this Congress acting in ways that split the industry in an election year," Davis said.

Privacy Site Launches

Privacy Council Inc. in Dallas last week launched an Internet-based source for information on business and legal issues relating to privacy. The site, www.privacycouncil.com, maintains a free library of state, federal and international privacy-law documents. Companies can use the site's automated privacy statement generator to create a privacy policy statement in English, Spanish and German at no charge.

Open-Source
Loses Some Glitter

*Bad week for Linux: Layoffs, no IPO
at LinuxCare; next kernel may slip*

BY DOMINIQUE DECKMYN

IT WAS A bad week for Linux. High-profile services company LinuxCare Inc. withdrew its initial public offering (IPO) last Monday and then announced layoffs. Meanwhile, reports surfaced that the next version of the operating system kernel will be late.

LinuxCare called off its IPO after the sudden departure of CEO Fernand Sarratin and the downturn in the IPO market. "Because of the delay in our IPO, we needed to reduce our burn rate and decrease our costs," said LinuxCare spokeswoman Michele Nemschoff. The San Francisco-based com-

pany is restructuring to focus on higher-margin enterprise integration services. It's also laying off an undisclosed number of workers in the process.

Analysts said they see LinuxCare as the first big victim of a Linux shakeout. "LinuxCare will get bought out or go bankrupt — forget about an IPO," said Jeff Hirschhorn, an analyst at New York-based IPO.com Inc. Hirschhorn said only a

handful of top-tier Linux players will do well.

"There's still a lot of uncertainty about whether you can survive just on services for open-source products," said analyst Bill Claybrook at Aberdeen Group Inc. in Boston.

Also last week, Linux kernel developers said the release of the much-anticipated Version 2.4 kernel, expected in July, may slip a few months. Products based on the kernel probably won't be available until fall. The delay proves that open-source development isn't immune to the

[The kernel
team
is under]
tremendous
pressure.

ERIK TROAN,
RED HAT INC.

slipping schedules that have affected other operating systems. However, executives at Linux distributors Red Hat Inc. and Caldera Systems Inc. said they aren't worried about the delay. "We're very supportive of [Linux developer Linus Torvalds] taking the time to get this right," said Drew Spencer, chief technology officer at Caldera in Orem, Utah.

The Linux 2.4 kernel is highly anticipated because it will offer greater symmetrical-multiprocessing scalability — a boon for servers — and better support for Universal Serial Bus, which is important for desktops and appliances.

Because many companies' revenues are at stake, and because of the media scrutiny, the kernel team is under "tremendous pressure," said Erik Troan, director of operating systems engineering at Red Hat in Durham, N.C. "That's probably one of the reasons they are slowing it down." ▀

MORE THIS ISSUE

For more open-source news, see page 24.

ETrade Fined for Slow Complaint Response

*Company cites
high growth rate*

BY MARIA TROMBLY

NASD Regulation Inc., the regulatory arm of the National Association of Securities Dealers Inc., last week censured and fined ETrade Securities Inc. \$20,000 for its slow response to the regulators' requests for information about customer complaints.

ETrade settled the matter without either admitting or denying the allegations.

According to NASD Regulation, on 17 occasions late last spring, ETrade, based in Menlo Park, Calif., failed to respond to the agency or failed to respond promptly.

"Prompt response to regulators' inquiries about customer complaints has to be front and center for all firms," said Barry Goldsmith, NASD Regulation's vice president of enforcement.

ETrade acknowledged that there was a problem but said in a statement that the issue

has been resolved. Phone calls weren't returned by press time.

The rate of customer complaints increased from one for every 3,877 executed orders in January 1999 to one for every 2,925 orders in March of that year.

However, by July, that num-

ber was down to one complaint received for every 6,497 orders, the company said. Meanwhile, the time ETrade took to respond to NASD Regulatory requests was brought down to two weeks.

The company said the cause for the spike in complaints

last spring was the company's growth rate — from 200,000 customers in 1997 to 1.3 million in 1999.

"One of the great challenges was handling the needs and requests of such a large number of customers," the company said. "As a result, ETrade has dedicated increased resources to streamlining the ability to handle a variety of issues and factors." ▀

Crime Penalties Stiffen

BY JAIKUMAR VIJAYAN

Perpetrators of some computer crimes such as credit-card and identity theft and online copyright violations could soon face longer prison time and stricter sentencing terms.

The U.S. Sentencing Commission last week sent Congress new guidelines that would substantially stiffen penalties for computer crimes.

Covered under the recommendations also are harsher terms for Internet-related sexual offenses against minors and offenses such as the uploading of pirated software to

illegal Web sites. If approved by Congress, the amendments would become effective Nov. 1.

"In a sense, this was almost inevitable," said Fred Cohen, president of Fred Cohen & Associates, a security consultancy in Livermore, Calif. "If you can't prevent crime, all you can do is increase the punishment."

Among the amendments proposed are the following:

■ A 25% increase in the jail term for identity theft from present limits.

■ A change in the way the loss attributable to a credit-card theft is calculated. The new

guidelines would place a value of \$500 on each stolen card, up from \$100. The increase changes the offense from a misdemeanor to a felony and would allow prosecutors to seek higher sentences.

■ An increase in prison terms for persons who use the Net to initiate a sexual relationship with a minor. Current guidelines limit a term to 24 months; proposed guidelines would push the limit to 51 months under some circumstances.

■ A change in the way the value of pirated software is calculated for sentencing purposes. The result: an increase in prison terms from the current 14-month limit to 46 months in some cases. ▀

Kaj Pedersen, VP of Engineering, Quote.com

"Reliability is key. In terms of stability and reliability, I've found the Windows and Compaq ProLiant environment to be significantly better than our Sun environment."



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FRONTLINE PARTNERSHIP

Patrol 2000 Delivers Elusive Integration

BY SAMI LAIS

Users are welcoming the result of two years of integration that has changed a collection of

tools from BMC Software Inc. and a couple of acquired companies into BMC's Patrol 2000, released today.

BMC had previously provided some bridging tools, such as Command/Post connectPatrol, delivered in March 1999.

But while that afforded interoperability with the tools from the acquired vendors — Boole & Babbage and BGS Systems — tight integration is what users were really clamoring for, said John Summit, presi-

dent of the Rocky Mountain Patrol User Group.

"The main things users are looking for is a single application, one installation procedure for all three, and a single agent with a common collector," Summit said.

That's what users get in Patrol 2000, said Steve Foote, an analyst at Enswers.com Inc. in Easton, Mass.

Patrol 2000 knits BGS's BEST/1 application performance monitoring tools and Boole & Babbage's Command/Post service level management software with Patrol application management suite.

Instead of using three agents and three sets of data, the new Patrol uses one agent and a single repository of data based on the Common Information Model (CIM) standard, a kind of Esperanto for data.

All BMC applications and any CIM-enabled applications from other vendors can access Patrol's common repository.

With this version of Patrol, "BMC is going after e-business in a big way," said Tim Grieser, an analyst at International Data Corp. in Framingham, Mass. The company has been moving away from a mainframe-centric lineup to an emphasis on distributed systems for four years, Grieser said. Gearing functionality to monitoring real-time e-commerce applications is "another major step in that direction," he added.

Foote spoke about life before Patrol 2000. Several years ago, when he was working as a consultant for Pfizer Inc. in New York, an application slowed, he said. Finding the cause — a poorly written SQL statement — took two days. And it wasn't fixed until five days after that.

"It took us seven days to do something using the bare-knuckles approach that [Patrol 2000] could do in 30 seconds," he said. ▀

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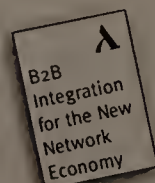
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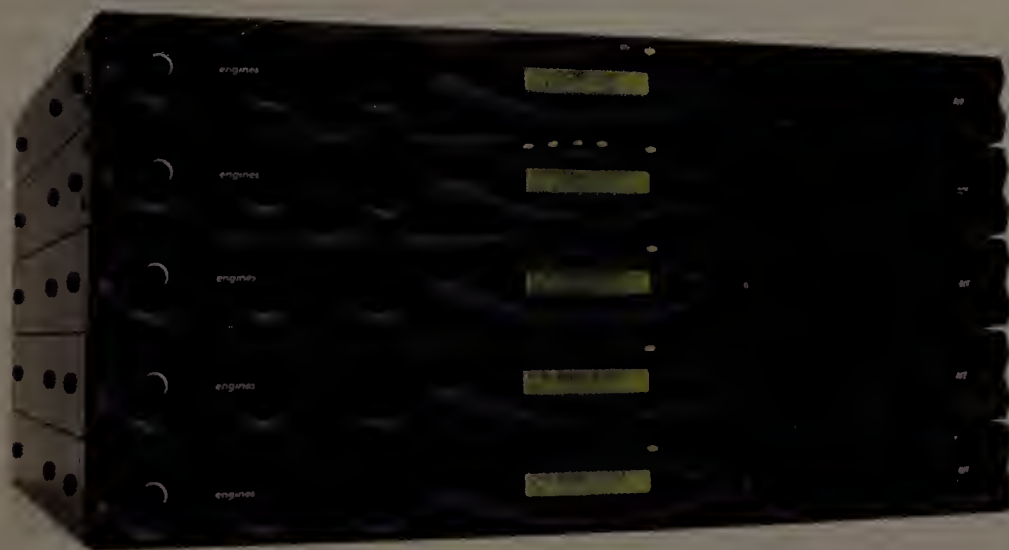
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AT A GLANCE

Patrol 2000

- Tight integration of Patrol, BEST/1 and Command/Post
- Single agent reports data for all three to a common repository
- Service-level reporting system based on the common repository
- Application-specific correlation models, first for Exchange, others to come
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Transporters to Benefit From Improved GPS

Greater accuracy could also help farmers

BY BOB BREWIN
AND LEE COPELAND

TRANSPORTATION COMPANIES will be among the beneficiaries of a White House decision last week to make more accurate Global Positioning System (GPS) signals available to civilian users. (For more on GPS use in the transportation industry, see page 28.)

Since the U.S. Department of Defense started launching GPS satellites in the 1980s, civil users, from hikers to surveyors, have taken advantage of the technology. However, they have been unable to tap into its full potential because of the intentional degradation of the signal to the 100-meter level by the military.

President Clinton halted that practice last week, making the military signal, which is accurate to the 10- to 20-meter range, available to all users.

Richard Langley, a GPS consultant at the University of New Brunswick in Fredericton, called the significance of that decision "huge," noting that "it will affect a large number of GPS application areas."

In-Vehicle Navigation to Benefit

Langley said in-vehicle navigation systems will quickly benefit from the improved accuracy. "Now, with 100-meter [accuracy], you might not even be positioned on the right road in the display," he said. "With [degradation] turned off, these kinds of matchmaking errors will be reduced."

Freightliner Corp. in Portland, Ore., plans to capitalize on these enhancements by offering receivers and navigational computers in its 2001 model year trucks.

Paul Menig, director of electrical and electronics engineering at Freightliner, said improved accuracy "will enhance the performance and potentially reduce the cost of

navigation systems onboard trucks." He explained that the more accurate GPS would eliminate expenses from using signal-correction techniques.

Even at 10-meter accuracy, the Burlington Northern & Santa Fe Railway Co. (BNSF) in Fort Worth, Texas, still finds raw GPS signals insufficient for surveying or train control without correctional systems.

However, a BNSF spokesman said, the improved quality of the civil GPS signals could ultimately lower the cost of developing those systems.

The improved signals should also boost GPS-aided smart-farming techniques, said Ron Milby, seed division manager at Growmark Inc., a Bloomington, Ill.-based farm cooperative.

Growmark provides its members with software that helps them use their GPS receivers to manage their crops by the meter rather than the

acre. The software helps determine the amount of fertilizer to apply to minute segments of a field by conducting soil analysis with the use of GPS information. At harvest, yield software used with combine-mounted GPS receivers lets farmers determine the success of the fertilizer applications. ▸

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Defining 'Spam' Technically Isn't Easy

Legislative solutions to problem weighed

BY PATRICK THIBODEAU

Doug Garfinkel was on an intelligence mission of sorts at a conference last week devoted to e-mail spam. His e-commerce company, BigStar Entertainment Inc., sells videos over the Internet and uses e-mail to keep its customers informed.

BigStar gets customers' approval before sending them e-mail. But Garfinkel said he's worried that a battle over spam could affect his company.

"We want to make sure that we are staying on top of all the issues associated with unsol-

icited e-mail," said Garfinkel, marketing director at New York-based BigStar. "We don't want to become an unsolicited e-mailer — there are varying definitions of what that is."

Spam is unsolicited commercial e-mail. But federal and state legislation could change the definition of unsolicited commercial e-mail by setting certain "opt-in" or "opt-out" procedures. For instance, if a law is written to require consent, then e-mail that uses an opt-out approach may be viewed as something similar to spam. Opt-out approaches require a customer to indicate that he doesn't want e-mail.

At the Spam Summit 2000 conference, organized by Brightmail Inc., a San Francisco-based antispam service, executives from direct marketers, Internet service providers, portals and other organizations debated how to best handle the problem.

Technical solutions, such as filtering on servers or clients, are limited in scope, since spammers can typically find ways around them, said several conference speakers.

Plus, there are risks associated with antispamming devices that try to distinguish between spam and legitimate e-mail sent by a company with a customer's consent.

"There is no way that tech-

nology alone can determine a piece of e-mail from spam," said Rosalind Resnick, CEO of NetCreations Inc., a New York-based direct marketing firm with 8 million customers. Her firm requires an opt-in process that customers must confirm.

There is also a push for legislation. Sixteen states have already approved some form of antispam legislation. And Congress is considering a measure, known as the Unsolicited Electronic Mail Act, that relies on civil litigation to attack spam. The bill would make it easier for Internet service providers to seek financial damages — up to \$500 per spam message — from people and companies who violate a service provider's policy.

But Deirdre Mulligan, staff counsel at the Center for Democracy and Technology, warned that the legislation would require the sender to know the policies of every Internet service provider that a message travels through. The bill would also give providers the freedom to write whatever policies they want. "I think we have the potential for lots of unintended consequences on the Internet," she said. ▸

MOREONLINE

For organizations, FAQs and stories related to spam, visit our Web site.

www.computerworld.com/more

FCC Delays Wireless Auction

The Federal Communications Commission, as expected, last week formally delayed the auction of next-generation mobile wireless spectrum from June until September, following complaints from broadcasters and wireless carriers that the rushed process didn't allow time to resolve potential conflicts.

The FCC, in a tersely worded public notice, said it postponed the auction of spectrum in frequency bands occupied by television channels 60 to 69 "in order to provide additional time for bidder preparation and planning."

BellSouth Corp. in Atlanta, US West Inc. in Denver and Verizon Wireless in Bedminster, N.J., all asked the FCC to delay the auction. In a letter to FCC Chairman William Kennard last month, US West asked for a delay in the auction, saying this "would allow the Commission time to conclude expedited rule-making processing that would facilitate clearing broadcasters" from the spectrum to be auctioned.

The National Association of Broadcasters, in its own letter to Kennard in February, said conducting the auction could "contravene" congressional directions to ensure that TV stations can continue to use those channels to provide analog television service until the switch to digital TV is finished.

A spokesman for Rep. Billy Tauzin (R-La.), chairman of the House Telecommunications Committee, said, "Billy thinks it makes sense to delay the auction until we can develop a sound spectrum policy." Congress mandated that the FCC conduct the auction of the spectrum in time to deposit proceeds in the Treasury by the end of this fiscal year, Sept. 30.

An auction of similar spectrum in the U.K. last month raised \$35 billion, and analysts have projected that proceeds from a U.S. auction could top \$100 billion. But, Tauzin's spokesman said, "We just can't auction spectrum to balance the budget" without first addressing issues raised by television broadcasters using channels 60 to 69 and the carriers that want to bid on the spectrum. — Bob Brewin

Opt-wars

Key in the spam debate is deciding the definition of frequently used terms. Not all companies agree on what "opt-in" means.

OPT-IN: Customer requests to be on a mailing list. But some companies define a prechecked form as an "opt-in," even though the customer must uncheck it to be taken off the list.

OPT-OUT: A customer is automatically included on a mailing list unless he requests removal. Many direct marketers, but not all, prefer this method.

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BRIEFS

New BMC Release

BMC Software Inc. in Austin, Texas, has introduced Web DBA, a Web-based administration tool for Oracle Corp. databases. Web DBA provides interactive access to a database from an Internet browser, simplifying administration, management and control as a result, according to the company. Web DBA is in beta now and scheduled for general availability next month for \$995.

Extensity Signs Deal

Barclays Global Investors in San Francisco inked a deal last week with Extensity Inc. in Emeryville, Calif., to use Extensity's automated expense-report software. Barclays said the Web-based software will save money and make it easier for employees to file reports.

Software for Census

Wheeling, W.Va.-based HGO Technology Inc. has announced that the U.S. Bureau of the Census will use HGO's Standard Occupation & Industry Coding software to process data from more than 30 million long-form census surveys gathered during the 2000 census. HGO said the bureau will save \$12 million by using the software rather than a staff to process the information.

J. D. Edwards Posts Second-Quarter Loss

J. D. Edwards & Co. in Denver announced that it expects to report total revenue of \$225 million to \$235 million for the second quarter ended April 30, compared with total revenue of \$232 million for the same quarter last year. The company also expects to report an operating loss of \$20 million to \$25 million as a result of lower-than-anticipated license-fee margins, plus sales and marketing activities.

Mac ASP for Business

Personable.com Inc. in Fountain Valley, Calif., last week rolled out corporate and consumer versions of its application-service-provider-delivered versions of Microsoft Corp.'s Office suite for Apple Computer Inc.'s Macintosh.

Analysts: Lockdown Vital to Win 2k Value

Managing desktops can help companies attain their ROI in less than a year

BY DOMINIQUE DECKMYN

THE REAL TOTAL cost-of-ownership benefits of Microsoft Corp.'s Windows 2000 Professional won't come automatically, analysts warn. To reap the full rewards, they say, information technology departments must move to a managed desktop environment — in other words, lock down end users' PCs.

If a company moves from an unmanaged Windows 95 desktop environment to a managed Windows 2000 desktop, its return on investment (ROI) can be attained in less than a year, said Stamford, Conn.-based Gartner Group Inc. analyst Michael Silver, speaking at the Gartner Group Windows 2000 in the Enterprise conference in San Francisco late last month. But without centralized control, he said, ROI can take years.

Like many IT executives,

John Scannello, consulting director of IT planning at Consolidated Edison Company of New York Inc., said he sees his company's planned Windows 2000 Workstation rollout as the perfect opportunity to regain control of desktops. He said he expects some user resistance. "But our senior management understands we need to control [the total costs], and the only way you are ever going to do that is with a meaningful lockdown," he said.

Past Problems

Until now, imposing centralized control has been difficult, said Paul Cassidy, a technology consultant at IT services firm Alpine CSI in Holliston, Mass. "People evaluated the Zero Administration Kit and Systems Management Server and saw there was a huge learning curve, so they decided to limp along with what they had," he said. But in Windows 2000, he said, features such as group

policies ease that burden.

Cassidy said companies should formulate a clear policy telling end users what they can and can't do with company-owned systems, then "market" this policy. "There's always going to be users who grumble about it," he warned.

Silver warned that it may be bad policy to first give a user a powerful new Windows 2000 machine, then lock it down later. Scannello agreed. "The way we would roll it out is that Windows 2000 systems would be locked down the day users get them," he said.

Consolidated Edison locked down about 10% of its desktops under Windows NT 4.0 about three years ago. "Once they get over the initial shock that they can't play games, it quickly becomes a nonissue," Scannello said.

Formulating a Plan

Cameron Cosgrove, vice president of information services at the life insurance division of Pacific Life Insurance Co. in Newport Beach, Calif., is still considering to what extent the company will lock down

Boosting ROI

Return on investment for Windows 2000 Workstation migration can be very short — if the migration includes a move to a managed desktop. For an enterprise with 2,500 users and 33 servers:

■ ROI for a migration from Win 9x to Win 2000 from an unmanaged to a managed environment:
6 months to 1 year

■ ROI for a migration from Win 9x to Win 2000 without moving to a managed environment:
1.6 years to 2.6 years

SOURCE: GARTNER GROUP INC.

end-user desktops when it rolls out Windows 2000. End users will be blocked from changing the Windows registry or the screen resolution, but Cosgrove said he is still uncertain whether to block other features such as installing software.

Cosgrove said he believes Windows 2000's group-policy features by themselves will drive down support costs even without a lockdown.

Jeff Cranney, help desk supervisor at Pacific Life, said Windows 2000 group policies are too hard to manage. Before implementing fine-grained desktop control, Cranney said, it's better to wait for good third-party tools. ▀

Microsoft Buys Firm to Add Biometric Hooks to Windows

Would add to users' arsenal of ID tools

JAIKUMAR VIJAYAN
AND DOMINIQUE DECKMYN

Microsoft Corp.'s purchase last week of biometric authentication technology from I/O Software Inc. should drive quicker user acceptance of biometric security tools, analysts said.

Microsoft acquired I/O Software's Biometric Application Programming Interface (BAPI) technology and its SecureSuite authentication software for an undisclosed sum. Riverside, Calif.-based I/O Software will continue to offer BAPI and

SecureSuite as add-on products for Windows platforms until Microsoft integrates the technology into Windows. No timetable was announced for the integration.

BAPI offers a way for application programs to talk to biometric devices. There are similar interfaces in Windows for printers, video cards and sound cards.

SecureSuite comprises biometric data management, device management and user interface software. Integrating these technologies into future versions of Windows will give biometric vendors a standard platform to develop for, said Shanen Boettcher, a

Microsoft project manager.

Several vendors, including American Biometric Co. in Ottawa, Iriscan Inc. in Marlton, N.J., and VeriVoice Inc. in Princeton, N.J., are already selling biometric products as add-on components to Windows.

But having a standard interface at the operating-system level will make it easier for those products to work with Windows, Boettcher said.

Name Power

Microsoft's involvement in biometrics "will give IT directors a heightened sense of comfort in using the technology," said Samir Nanavati, an analyst at International Biometric Group, a New York-based consultancy.

"It's good to know Microsoft will be playing in this arena," agreed Frank Annerino, director of corporate information security at insurance broker-

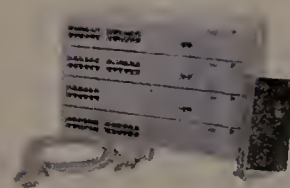
age Aon Corp. in Chicago. "From time to time, we have been concerned about the staying power of some of the smaller companies [in biometrics]."

Aon has considered implementing biometric systems such as fingerprinting and voice recognition and is likely to start piloting such technology within the next year.

Biometric authentication involves verifying a person's identity by comparing physical characteristics — such as fingerprints — with stored data. The approach is believed to be far more reliable and more secure than current authentication methods such as passwords, smart cards and personal identification numbers.

Biometric authentication devices include fingerprint scanners, iris scanners and voice verification systems. ▀

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Oracle, IBM Lead in Databases; Demand Up

Users explain how business intelligence apps, Net projects fueled growth in 1999

CHRISTINE MCGEEVER

ORACLE CORP. and IBM are the clear winners among the business intelligence users and Internet companies that fueled growth in the database market last year.

San Jose-based Dataquest last week reported that worldwide database sales, driven by strong growth in Internet-based computing and business intelligence applications, totaled \$8 billion last year, up from \$7.1 billion in 1998.

Oracle and IBM shared 61% of the total database software market, with 31.1% for Oracle and 29.9% for IBM, according to the report. Microsoft Corp. held a 13.1% share (see chart).

Both large, mainstream companies and small dot-coms cite investments made last year in Internet-based data management systems and in business intelligence applications based on data warehousing that let users analyze high-volume,

fast-changing data generated by e-commerce.

Pat Komar, vice president of corporate information technology at Prudential Insurance Company of America in Newark, N.J., said his company began its data warehousing efforts in 1996 with a retail customer information warehouse that included more than a terabyte of data. That warehouse has since more than doubled in

volume, and the company now has an additional 35 multiple-terabyte warehousing projects either planned or already under way. Each project has a six-month development time frame and at least \$1 million in IT resources earmarked for it.

Komar said Prudential is running IBM's DB2 and vertical applications from Oracle. Its primary warehousing tool is Platinum from Computer Associates International Inc. in Islandia, N.Y. "We're partnering with ... vendors we know are going to be around for a few years," he said.

Oracle's reputation among the dot-coms helped it last year. Chris Duffy, chief technology officer at Kansas City, Mo.-based Idmarket.com, a Web marketplace for packaging and identification products, said his firm evaluated the Microsoft SQL Server 7.0 and Oracle8i databases and went with Oracle because of his staff's experience with it. SQL Server's lower implementation cost wasn't as important as his staff's ability to build a reliable, scalable Internet server, he said.

According to the report's author, Dataquest analyst Norma Schroder, Oracle's new licenses for databases grew 19%; IBM also reported strong sales overall, in part because of strong mainframe database sales. Sales for SQL Server 7.0 were strong as a result of

pent-up demand for the release of the product, which was delayed from the previous year. ▀

Dead Heat

Top worldwide database market share estimates, based on new license revenue

| | 1999 MARKET SHARE (%) | 1998 MARKET SHARE (%) |
|-----------|--------------------------------|--------------------------------|
| Oracle | 31.1 | 30.7 |
| IBM | 29.9 | 30 |
| Microsoft | 13.1 | 10.7 |
| Informix | 4.3 | 4.8 |

DATAQUEST PREDICTS:

- The overall database market is expected to reach \$12.7 billion by 2004.
- Windows NT database revenue may grow 10%.

SOURCE: DATAQUEST, SAN JOSE

Continued from page 1

Auto Exchange

The suppliers said consumers and technology firms like Commerce One Inc. in Pleasanton, Calif., and Oracle Corp. stand to reap the greatest benefits from the endeavor.

Analysts said technology firms are charging premium rates and seeing high stock-market valuations from building Web-based exchanges,

but the trend is unlikely to last.

"The huge equity stakes and transaction fees that technology companies are getting are not likely to continue long term as suppliers and buyers look at their options more rationally," said Bruce Temkin, an analyst at Forrester Research Inc. in Cambridge, Mass. The buyers and suppliers "don't want to be trapped into deals with vendors that extract all the savings that they could gain by participating."

"What you're seeing now is a

very immature market, and the technology vendors are extracting a fairly large premium for their services," he said.

Yet more than half the suppliers surveyed said they plan to create their own online exchanges, despite the cost. For example, Dana Corp., an automotive driveshaft and piston ring maker that conducts \$3 billion in business with Ford Motor Co. in Dearborn, Mich., and DaimlerChrysler AG in Stuttgart, Germany, plans to trade on the exchange. But the

Toledo, Ohio-based manufacturer still intends to develop a separate procurement exchange for its 86,000 suppliers. The automakers had hoped such suppliers would channel their \$500 billion in annual buying through the exchange.

Analyst Barbara Reilly at Gartner Group Inc. in Stamford, Conn., said that by creating an exchange for their own suppliers, big automotive suppliers get a chance to participate in the revenue generation. But "it's starting from scratch, and [the suppliers] will go through the same hurdles as the automakers," Reilly said.

Two months after the historic agreement by automakers to form the exchange, integration hurdles remain. The exchange still lacks major working parts: a top executive, an official name and Web address and a definitive agreement among the major participants.

It is also the subject of a Federal Trade Commission (FTC) investigation into the antitrust implications of a single trade exchange for automotive suppliers and dealers.

David Barnas, a spokesman for General Motors Corp. in Detroit, said the investigation has stalled efforts to accelerate the rollout of the exchange.

Still, the Big Three automakers were able to draw Nissan Motor Corp. in Tokyo and Renault SA in Boulogne-Billancourt Cedex, France, which holds a 37% equity stake in Nissan, into the exchange. ▀

Continued from page 1

XML

modems for EDI might have to upgrade their connections to the data center.

"Just because it's easy to create an XML document, they shouldn't go hog wild in sending a lot of extraneous, unnecessary data," warned Rachel Foerster, a project team leader for the electronic-business XML standards effort and a principal at Rachel Foerster & Associates, an e-commerce consultancy in Beach Park, Ill.

Indeed, several early adopters said they use XML only to exchange small amounts of data and have encountered no problems with large XML files.

John Deaton, vice president of planning at Office Depot Inc. in Delray Beach, Fla., said his company's purchase-order

transaction sets are typically less than 1KB. "It's a nit on the network," he said.

Competitor Staples Inc. has seen no XML-related bottlenecks either. Garn Evans, a manager of information systems at the Framingham, Mass.-based office supply company, said a WebMethods Inc. B2B server strips out the incoming XML tags and translates them into Staples' proprietary document format before the information traverses the internal network.

Some companies have more ambitious XML plans. David Westmoreland, CIO at Arrow Electronics Inc. in Melville, N.Y., estimated that his company handles \$3 billion to \$4 billion worth of EDI transactions per year, but he said he expects all transactions, large and small, to shift to XML during the next three to five years.

"You have to make sure, as

you're scaling your network and computers, that you're getting the business benefit out of the technology," said Westmoreland. "And if you're not, you shouldn't do it."

Westmoreland said he thinks his company will win more business because it can respond to customers in real time, using XML, rather than waiting hours or even days for EDI transactions to turn around in batch mode. While cognizant of XML file size, Westmoreland

said he's not worried, since network and storage costs are continually coming down.

But some analysts and users caution that XML might not be suited for every type of transaction. They expect that many companies will have a blended XML/EDI strategy.

Ken Vollmer, an analyst at Cambridge, Mass.-based Giga Information Group Inc., has predicted that EDI files will grow 30% to 40% as they shift to XML but says he doesn't think file size will create a crisis, because XML adoption will be gradual.

Forrester Research Inc. analyst Josh Walker said companies will learn to architect around the XML file size issue. Products that can quickly translate XML, from vendors such as Active Software Inc., Neon Software and Vitria Technology Inc., will also help, he said. ▀

XML Transition

B-to-B users may need to:

- Take a gradual approach to XML adoption
- Expand infrastructure
- Implement a B-to-B server to translate XML documents
- Compress XML files

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Blue Martini User Conference Trumpets Selling Online

New methods used to build on existing e-commerce customer base

BY MARK HALL

DESPITE THE beating business-to-consumer vendor stocks have taken and recent reports critical of the future of business-to-consumer Web sites, attendees at e-commerce software vendor Blue Martini Software Inc.'s first user conference were remarkably upbeat about the prospects for operations targeting consumers. The event was held last week in San Francisco.

"Consumers are out there, and they want to buy things," said Paren Knadjian, CIO at New Media Network Inc. in Los Angeles, which is readying Egroove.com to offer licensed music to online buyers.

Just last week, The Gym-

boree Corp. in Burlingame, Calif., unveiled its new Web site. To build it, the company traded its old e-commerce system for one sold by San Mateo, Calif.-based Blue Martini.

Susan Neal, Gymboree's vice president of business development, said the company has made a sizable investment in its Web selling infrastructure, upgrading not only its e-commerce application but also its Windows NT computers to Solaris-based servers from Sun Microsystems Inc. to handle the increased site traffic.

Neal said Gymboree is also rolling out a pilot project that will put devices from Santa Clara, Calif.-based Palm Inc. into customers' hands inside some of the company's 550 retail outlets nationwide. She

said store customers will be able to get product information over the wireless link in the handheld devices or order versions of items not in stock for free home delivery.

Given these new ways of keeping customers informed, Neal said, she has to think carefully about managing the content on her site. It needs to be easily searchable, she said, so that "it replicates the in-store experience."

According to Forrester Research Inc., 36% of online retailers say content is what helps sell goods, making it the top factor in a survey conducted by the Cambridge, Mass.-based market researcher. Sean Malone, chief technology officer at Craft.com in San Francisco, said his company has developed attributes for all of its content, creating content objects that can be managed without information technology intervention, making for

Seven Hot Items For E-Commerce

- Data visualization tools
- Multibyte language support
- Broader platform support
- Tighter integration with in-store operations
- Pervasive wireless access
- Increased security
- Better content management tools

SOURCE: BLUEPRINT 2000 ATTENDEES

better and more timely information on the Web site.

Sophisticated tools are needed for this kind of management, Neal said. But users in the highly competitive business-to-consumer market say they aren't cheap. Knadjian la-

beled Blue Martini's product line "expensive." But, he said, "it has a lot of built-in functions that make it a buy vs. build decision for IT."

Mitchell Kramer, an analyst at Patricia Seybold Group in Boston, said, "The business volumes are greater in B-to-B, but that's more about cost justification and supplier relationships. B-to-C is actually a new way of doing business."

"B-to-C is not dead," said Nadine Sakowski, director of engineering at Medical Self Care Inc. in Emeryville, Calif. "Lots of people are shopping on the Internet. We just want to make it easier for them." Medical Self Care will be integrating its catalog operations with its Web business, Self-Care.com, which already boasts 850,000 unique monthly visitors.

For example, customers will be able to use the promotion code on catalogs to get online discounts, allowing the company to gather more detailed demographic data on buyers.

"We've only scratched the surface of giving consumers an interactive shopping environment," said Blue Martini CEO Monte Zweben. ▀

Hotels Go Online for Supplies

Marriott, Hyatt start new company

BY MICHAEL MEEHAN

Marriott International Inc. and Hyatt Corp. last week announced plans to launch a company later this year that will serve as an electronic-procurement network.

Rather than work separately to buy towels, toilet paper and mints for their various properties, Washington-based Marriott and Chicago-based Hyatt said they will combine their buying power and have suppliers bid for business. Together, the chains need to supply items for more than 2,000 hotels and resorts worldwide.

Real-Time Transactions

Marriott and Hyatt plan to use a business-to-business network that was created by GoCo-op Inc., a software vendor and application hosting

firm in Maitland, Fla. The network will use XML technology and SAP AG's enterprise resource planning applications to process real-time transactions for the hotels.

Marriott and Hyatt said they expect to buy more than \$5 billion worth of supplies annually through the new company, adding that other hotel chains may be welcomed as members in the near future. GoCo-op said it expects to have thousands of suppliers bidding against each other in the new marketplace.

The entrance of the hoteliers onto the online procurement scene follows the lead of PurchasePro.com Inc. in Las Vegas, which runs a purchasing network for hotels there.

To supply the Las Vegas hotels, Zoho Corp. in Sunnyvale, Calif., launched an online buying collective in March with backing from Harrah's Entertainment Inc. in Memphis; Ariba Inc. in Mountain View, Calif.; and Dell Computer

Corp. in Round Rock, Texas.

The Marriott/Hyatt network is the first such venture to arise from within the major chains of the hotel industry.

Kevin Mitchell chairs the Lafayette Hill, Pa.-based Business Travel Coalition, which recently formed an electronic-business forum that includes the Big Three automakers and

Black & Decker Corp. The forum plans to investigate online group purchasing of everything from corporate travel to industrial supplies.

Mitchell said he believes that virtually every company will have to form buying coalitions that look to create purchasing strength in numbers as a way to cut supplier costs. He

said such coalitions are forcing some businesses to partner with their fiercest rivals — competing on some levels, while cooperating on others.

"If you can remove systemic costs from your operation, why wouldn't you do that?" Mitchell said. "And the Internet is the perfect tool to [eliminate] distributor costs." ▀

Court Backs ISP Ruling

BY BRIAN SULLIVAN

The Supreme Court last week let stand a lower court ruling that says Internet service providers (ISP) can't be held liable when a person is defamed in e-mail or online bulletin board messages.

Acting without comment, the court rejected an appeal filed by plaintiff Alexander G. Lunney after the New York Court of Appeals dismissed his suit against Prodigy Ser-

vices Co. late last year.

The suit stems from a 1994 incident in which an imposter sent several vulgar e-mail messages in Lunney's name to a Boy Scout leader in the town where he lived. Lunney's father sued Prodigy claiming that the boy, then 15, was "stigmatized by being falsely cast as the author of these messages," according to court records.

In its December ruling, the New York court said Prodigy couldn't be held liable because it can't be considered the publisher of the messages.

The appeals court also rejected an assertion by Lunney that Prodigy failed to properly investigate people when they

signed up for e-mail accounts and thus allowed the imposter to create a false account using Lunney's name.

Prodigy argued that such a standard would be impossible because it would require "an ISP to perform investigations on millions of potential subscribers," court records say.

According to court records, Lunney proved he didn't write the messages. But he still received a letter from Prodigy saying it was closing his account due to the obscene content of the messages. When it was determined that Lunney hadn't actually opened the account, Prodigy apologized, the court records say. ▀



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Partial Reunification May Give BSD New Visibility

Users say 'other' free Unix has advantages over Linux

BY DOMINIQUE DECKMYN

LINUX IS GETTING all the media and developer attention. But users of Berkeley System Distribution (BSD) — the “other” open-source Unix derivative — remain loyal. And analysts say that for some users and resellers, BSD still has an edge over its much-hyped cousin.

The BSD community, which, like Unix itself, fragmented into multiple variants such as FreeBSD, NetBSD and BSD/OS, initially experienced the Linux tsunami. But in March, two versions were partially reunited when Berkeley Software Design Inc. (BSDI), the developer of the commercial BSD/OS, acquired Walnut Creek CDROM, a key distributor and developer of FreeBSD.

The resulting company will provide

support for FreeBSD. Both BSD variants will increasingly share code, though they won't merge in the foreseeable future, executives said. That may cause confusion, warned George Weiss, an analyst at Gartner Group Inc. in Stamford, Conn. But Weiss said the merger could create some sorely needed visibility for BSD.

BSD vs. Linux

BSD's loyal user base includes some of the world's biggest Web sites. Most of Yahoo Inc.'s Web servers run FreeBSD, and that's unlikely to change, said co-founder and Chief Yahoo David Filo. When picking a platform for its site, “we noticed that BSD scaled better than other operating systems,” Filo said. He said BSD still maintains an edge over Linux as far as reliability is concerned.

“That's where the long history of BSD makes a difference,” he said.

Steven Schultz administers about 30 servers running BSD/OS at Thousand Oaks, Calif.-based General Dynamics Electronic Systems, a division of defense contractor General Dynamics Inc. He has experimented with Linux but finds BSD easier to configure. He said there were problems in the past when incompatible C libraries meant some Linux applications would no longer run on newer versions of the operating system. Schultz said he hopes the BSDI merger will lead to more hardware drivers for BSD/OS.

Weiss said he believes BSD has some strong advantages, especially for resellers, who can customize BSD without having to give away the modifications to the open-source community as they would for Linux. For such companies, “BSD has the more advantageous licensing agreement,” Weiss said.

We noticed that BSD scaled better than other operating systems.

DAVID FILO, CO-FOUNDER, YAHOO INC.



But BSD faces an uphill struggle. Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass., said he believes Linux has the advantage of being personified by the charismatic Linus Torvalds, whereas BSD is offered by “a faceless committee.”

Siemens Expands Medical Business With \$2.1B Deal

BY JULEKHA DASH

Last week's bid by German industrial giant Siemens AG to purchase health care technology firm Shared Medical Systems Corp. (SMS) for \$2.1 billion in cash could mean more comprehensive products for users, although Siemens will face some technology challenges, according to analysts.

If the deal goes through, Malvern, Pa.-based SMS will be incorporated into Siemens Medical Engineering Group, a division of Munich, Germany-based Siemens. The transaction will likely be completed next month, pending regulatory approval.

Simmi Singh, a vice president at consulting firm SeraNova Inc. in Edison,

N.J., said the merger would provide SMS with the capital to move from a mainframe-based remote computing model to an application service provider model. According to Singh, the difference between the two is that in the mainframe-based model, clients access applications via a private network over a dedicated T1 line, whereas the application service provider model does so via the Internet or an intranet. Also, the service provider model conducts transactions in real time rather than batching them nightly.

Currently, many hospitals have to rekey information printed out from their medical equipment into their computer systems. By acquiring a software company that has one of the largest installed bases of applications, Siemens will have an easier time integrating information from its X-ray and lab equipment and other medical devices with information technology, said Mark Anderson, a vice president at Meta Group Inc. in Stamford, Conn., and a former hospital CIO.

SMS provides application hosting, e-commerce

and systems management and has 5,000 customers, according to the company's Web site.

But Michael Davis, a research director at Gartner Group Inc. in Stamford expressed doubt that the acquisition would make Siemens stand out because the company would still have to provide interfaces for applications from other software vendors. Reconfiguring “services and products to deliver a higher quality solution will take some time,” Davis said. “It's difficult for companies to come into the application space and do well.”

Both Davis and Anderson pointed out that previous attempts by other large companies that didn't specialize in health care to enter the health care industry weren't successful. Siemens is no stranger to the health care industry, but it is new to the software application space, both analysts said.

“Are they going to stick with it?” asked Anderson.

A Siemens spokeswoman said it was too early to talk about the company's acquisition strategy. But she did say that Marvin Cadwell, president and CEO of SMS, would continue to lead the SMS group. He will report to Erich Reinhardt, president of Siemens Medical Engineering Group.

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A Big Deal

Siemens' planned acquisition of SMS:

- Involves an offer of \$2.1 billion in cash
- Will likely be completed by end of next month
- Would unite a medical equipment provider with a software and services vendor

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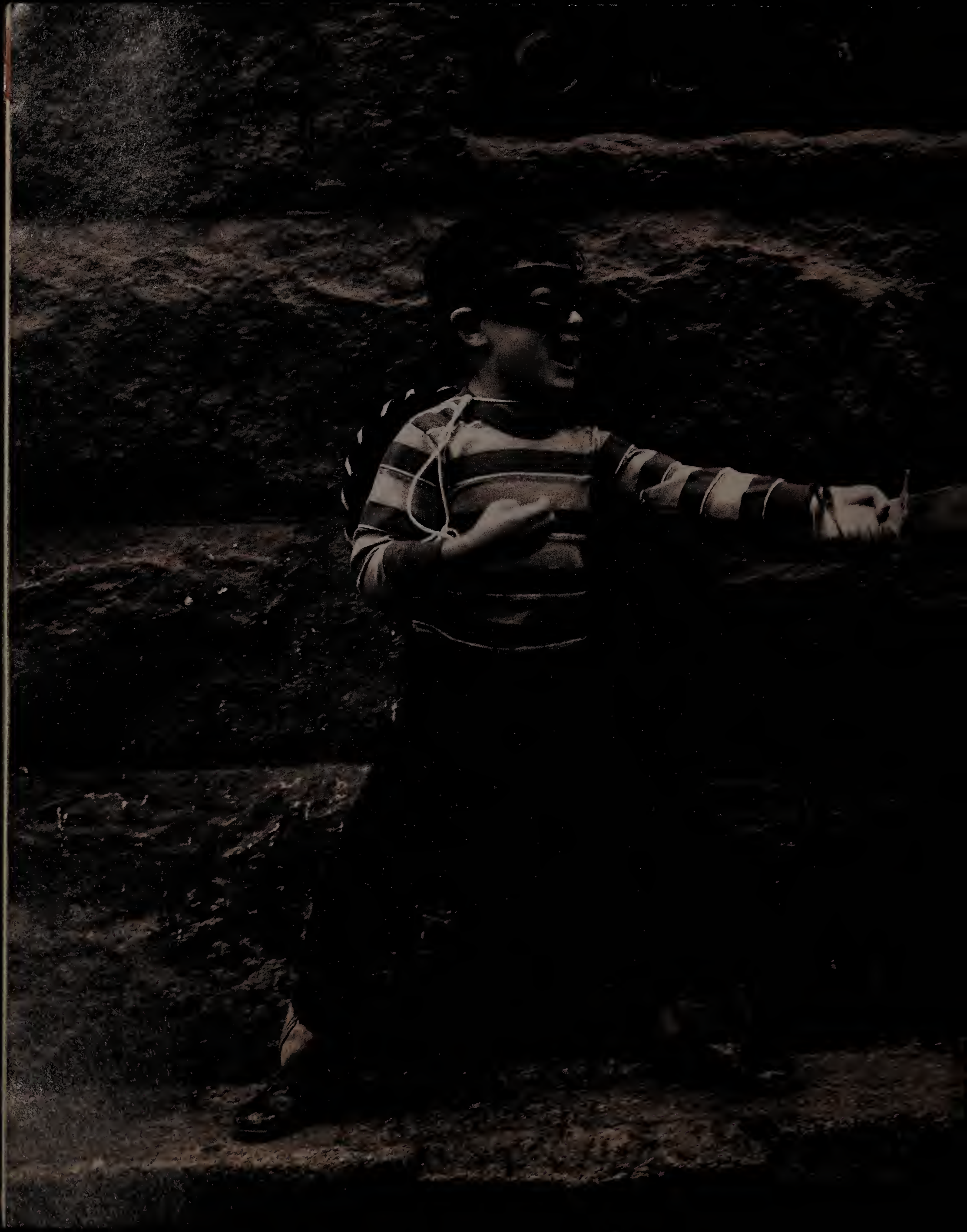
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Wireless LAN Cuts Carrier's Shipping Time

*Drivers' waits now
average 17 minutes*

BY BOB BREWIN
SEATTLE

A trucker picking up a 40-foot container at the American President Lines (APL) pier and terminal here waits an average of just 17 minutes from the time he arrives to the time he's ready to hit the road. That's less time than it takes an airline to deliver a bag to a passenger at most airports.

How could it be so fast? APL uses an automated, wireless system to track containers parked across its 160-acre facility, which was recently remodeled at a cost of \$275 million.

The system is based on a wireless LAN from LXI Inc. in

Norcross, Ga. The LAN is the link between terminal managers and the trucks, cranes and "pickers" that shuttle containers in and out of the port and on and off ships.

APL's trucks are equipped with dashboard-mounted mobile computers hooked into the wireless LAN. The computers track containers via radio frequency tags that are mounted on the chassis on which containers are placed. A satellite Global Positioning System (GPS), now being piloted, will help locate containers even more precisely.

Debbie Gebeyehu, an APL applications executive, said the company chose the wireless LAN technology because nothing else can meet the demands of a truly mobile operation.

Tom Hogue, manager of ter-

minal services at APL here, said the company "automated this terminal as much as possible" to speed up turnaround for customers, who increasing-



WIRELESS technology allows carrier APL to speed up shipments

ly operate under the just-in-time delivery mode. Independent truck drivers also benefit, since they can make more trips. Specific costs of the automation weren't available, Gebeyehu said.

Dan Gatchet, president of Seattle-based West Coast Trucking Inc., which hauls containers to and from shippers, called the APL terminal "the best in the area. I wish there were more terminals that used automation to speed the flow of containers."

APL has also managed to get the unionized longshoreman workforce at the terminal to buy in to the new technology, a key factor in the success of any automation process on the docks, Gatchet said.

The GPS pilot involves a mobile inventory vehicle (MIV) equipped with a GPS receiver, a chassis tag scanner and cameras to scan the rows of containers. The MIV starts its scan

by placing its left wheel on a precisely surveyed mark at the beginning of each row. As the MIV moves, the on-board system scans for containers and tagged chassis. At the end of the row, the driver pushes a button, and the containers' locations are transmitted via the wireless LAN to a map of the terminal displayed on a dispatcher's screen.

Gebeyehu said training hasn't been an issue. "All the drivers really have to do is push a button," she said.

Craig Mathias, a consultant and president of Farpoint Group in Andover, Mass., said the use of a wireless LAN in a widespread area such as the APL terminal has become a "very common technique, just like an ordinary LAN." But, he added, GPS as a pinpoint location technique would work best in a self-contained area, such as a precisely surveyed APL terminal. ▀

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Novell Warning Stirs Fears About Viability

Analysts doubt Net Services strategy can compensate for flagging sales of NetWare

BY DOMINIQUE DECKMYN

A WARNING FROM Novell Inc. last week that revenue and profits for its latest quarter will fall short of expectations hammered the company's stock and revived concerns about its viability. Analysts voiced doubts that the company's new Net Services business will take off quickly enough to compensate for flagging sales of Novell's core NetWare product.

Novell said it expects to announce later this month revenue of just over \$300 million for the second quarter ended April 30, compared with \$316 million for the previous quarter and \$316 million for the same period a year ago. Earn-

ings will be around 8 cents per share. First Call/Thomson Financial in Boston previously reported a consensus estimate of 16 cents.

"They have not been able to generate new business as fast as the old business is going away," said Peter Ausnit, an analyst at Prudential Securities Inc. in San Francisco.

Novell blamed this quarter's disappointing results on a decline in channel sales and large account site-license sales. Executives said the introduction of Windows 2000 and "growing market interest" in Linux, as well as market moves toward the application service provider model, were creating uncertainty and delaying sales.

Novell expects growth to come out of its Net Services

strategy, outlined by President and CEO Eric Schmidt earlier this year, to deliver Internet and intranet services based on its Novell Directory Services.

Novell executives said sales and marketing efforts will be realigned around Net Services, an undertaking that would take at least the remainder of fiscal 2000 to complete.

Analysts are generally upbeat about the Net Services vision. But Joel Achramowicz, an analyst at Preferred Capital Markets Inc. in San Francisco, expressed doubts about whe-

ther Schmidt can manage Novell's transition to Net Services.

"I think Eric enjoys talking about the technology, but I wonder whether he can actually make the deals" with major customers in the Internet space, Achramowicz said.

George Weiss, an analyst at Stamford, Conn.-based Gartner Group Inc., said he sees Windows 2000 and Linux subjecting other systems, including NetWare and The Santa Cruz Operation Inc.'s UnixWare, to a "pincer movement."

"They've got another two or three quarters to turn things around," said Laura DiDio, an analyst at Giga Information Group Inc. in Cambridge, Mass. "Otherwise, Novell stands on the brink of becoming the Banyan Vines of the 21st century." ▀

Eroding Market

Novell's flagship NetWare product sold well last year, but Windows NT/2000 and Linux are growing much faster, as evidenced by worldwide server operating system market share for 1999:

| | | |
|---------------|-----|------------------------|
| • Windows NT: | 38% | (24% growth over 1998) |
| • Linux: | 25% | (93% growth) |
| • NetWare: | 19% | (5.9% growth) |

SOURCE: INTERNATIONAL DATA CORP.

Compaq Is Striving for Greater Storage Visibility

Must sell outside own customer base

BY KATHLEEN OHLSON

The biggest hurdle Compaq Computer Corp. has to overcome in the storage business just might be itself.

The Houston-based PC and server vendor has an impressive storage story to tell, but analysts and users said the company hasn't managed to tell it.

According to Stamford, Conn.-based Meta Group Inc., Compaq finished a distant second behind Hopkinton, Mass.-based EMC Corp. in a poll of storage users.

Meta Group analyst Carl Greiner said Compaq executives have failed to emphasize the need for the company to consistently sell outside its

own customer base. That has forced the company to take a back seat.

But analysts said Compaq is rolling out products with capabilities that customers want such as managing storage-area networks (SAN), which Compaq has addressed as part of its Enterprise Network Storage Architecture (ENSA) initiative.

Potential Presence

One element under development — a management appliance — is a hardware platform for Compaq's SAN management applications. The platform could potentially become a SAN metadata server, managing access to data in a multi-host SAN environment, according to John Webster, an analyst at Nashua, N.H.-based Illuminata Inc.

Webster said this type of

product could enhance Compaq's presence in the storage market, but the company has to develop a strategy.

"The technology they're doing right, but they still need to work on marketing. It's a dichotomy they're aware of," Webster said.

If it sends a "strong, consistent message" pushing the ENSA initiative, Compaq could start snagging enterprise market share away from EMC, Webster added.

Out In Front

Compaq's presence in the storage market:

SALES OF U.S. DISK-BASED STORAGE SYSTEM MARKET LEADERS IN 1999

TOTAL REVENUE: \$12.77B

| | |
|--------|---------|
| Compaq | \$2.56B |
| EMC | \$2.26B |
| IBM | \$1.36B |
| HP | \$1.28B |

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS., 1999 WORLDWIDE DISK STORAGE SYSTEMS MARKET REVIEW AND FORECAST

The key is getting the message to corporate information technology decision-makers. Joe Furmanski, manager of systems and planning at UPMC Health System in Pittsburgh, said he had to educate his CIO about why Compaq's storage products are being used instead of EMC's.

"EMC markets at his level; Compaq doesn't," Furmanski said. But Compaq has a decent reputation in the storage industry, and it's a question of dedicated sales to the high-level corporate market, he added.

According to Bob Zimmerman, an analyst at Giga Information Group Inc. in Santa Clara, Calif., Compaq is also offering what IT shops want — a single vendor to go to for storage and other hardware systems.

"What's getting lost in the shuffle is Compaq is selling solutions, not boxes," Zimmerman said. "It's providing users ways to fix problems, rather than [saying], 'Here are the pieces to fix, and you integrate them yourself.'" ▀

BRIEFS

Content-Management Company Announced

Intel Corp. and Excalibur Technologies Corp., a Vienna, Va.-based vendor of content-management software, last week said they plan to form an interactive media services company that will offer to help users distribute branded content over the Internet. Intel will dedicate its Interactive Media Services division to the new company and invest \$150 million in exchange for a 60% equity stake in the venture, which is slated to launch in the third quarter.

Great Plains to Buy Applications Rival

Great Plains Software Inc., a Fargo, N.D., maker of business applications for midsize users, last week announced plans to acquire rival Solomon Software Inc. in a cash and stock transaction valued at about \$140 million. Great Plains said the acquisition will round out its line of applications and allow it to pick up Solomon's customer base of about 20,000 companies. Perhaps even more important, the deal gives Great Plains access to Solomon's workforce.

High-Tech Vendors Form Exchange

Twelve technology vendors, including Compaq Computer Corp. and Hewlett-Packard Co., last week announced their intent to launch an independent company that will operate an open Internet exchange to serve the needs of the high-tech supply-chain community. The venture aims to reduce levels of inventory throughout the supply chain by better matching supply and demand.

SAP Turns to Clarify For CRM Help

Industry analysts last week praised an announcement by SAP AG that it will resell customer relationship management (CRM) software made by Nortel Networks Corp.'s Clarify unit. The analysts said it was a sign that the German applications vendor now realizes it can't try to develop everything in-house.

What is Windows 2000 Advantage?

Windows 2000 Advantage is the partnership among Microsoft, Compaq and Computerworld Enterprise Business Solutions to inform IT leaders about Windows NT and Windows 2000 technology by providing timely, useful information — in print and online — for planning and deploying Windows NT and Windows 2000 with Compaq services and solutions.

Online This Week

Compaq, Altiris offer software deployment tools

Compaq Computer Corp. and Altiris Inc. entered into a partnership to provide tools for deploying PC software and operating systems, including Windows 2000. The tools allow client machines to be upgraded seamlessly.

Windows 2000 Terminal Services provides server-based computing

One of the benefits of Windows 2000 Server versions is the inclusion of Terminal Services capability. This technology permits the Windows 2000 desktop and applications to be used on a wide variety of systems including Windows PCs, Windows-based Terminals, Windows CE devices and even non-Windows desktops.

The Vital Exchange 2000 Link: Active Directory Connector

A link is required between the Exchange 5.5 Directory Store and the Active Directory to enable users attached to the different versions to communicate with one another. This link is accomplished using the Active Directory Connector.



How would you rate Compaq's Customer Services and Professional Services when it comes to helping you deploy Windows NT and Windows 2000?

Cast your vote now at

www.Windows2000Advantage.com.

Check out the current results:
Base: 39 ►



Microsoft

Compaq

Windows 2000

Windows NT: Still alive and well

By Nora Isaacs

Windows 2000 has been hailed by Microsoft as a must-have upgrade from its predecessor, Windows NT 4.0. With the flurry of activity surrounding the recently-released Windows 2000, NT users are wondering what the future holds in store for them. Should they upgrade, wait for NT's next iteration or just stay put? Read on for the answers.

"Basically, the choice is theirs," says Craig Beilinson, Microsoft's lead product manager for Windows 2000. "Customers have the option of determining what will have the quickest, greatest impact on their business in terms of desktops, servers, web servers, Active Directory, etc., and they can easily move in the direction that's appropriate for them."

While Windows 2000 is undoubtedly a more robust operating system than NT, there are certain advantages to sticking with NT for the next two to 18 months.

Switching means treading in uncharted territory. NT, which arrived on the scene in 1996, has endured four years' worth of tweaking and troubleshooting. NT testers have run into just about every problem possible and accumulated a tremendous knowledge base. By way of comparison, due to its relative state of infancy, troubleshooting information for Windows 2000 is harder to come by.

"I'd be a little conservative before going to a new system," says Marcus Gonçalves, senior IT enterprise applications analyst at ARC Advisory Group. "There have been a lot of people working on NT over the years. When coming out of a crisis, you'll have much more luck with NT than Windows 2000."

Thus, an upgrade could be frustrating in many ways. "For those customers now familiar with directories per se, I would say that Active Directory could be a stumbling block," says Phill Lawson-Shanks, Compaq's manager of Windows 2000 server programs. "A shift in world-view in how you relate to an OS must take place."

Sticking with NT has other advantages. It's extremely user-friendly, especially for small and midsize companies that require a lot of interaction with the end user. Also, NT's hardware requirements aren't as hefty. Running Windows 2000 requires a powerful PC with a lot of memory, RAM, hard disk space and power. Windows NT integrates easier with legacy systems, making it cheaper to deploy and maintain.

For those who are still reticent to make the upgrade, Microsoft's rapid deployment programs might quell any fears of the unknown.

Compaq's Windows 2000 migration plan, for instance, is a process that starts with an assessment by a professional services consultant who helps customers understand their environment, analyze their current IT infrastructure and determine if an upgrade would be the most appropriate action. This is followed by a design review, pilot process, planning design, and finally, implementation.

Sticking with Windows NT 4.0 means missing out on Windows 2000's many advantages, including enhanced reliability, productivity, security, scalability and connectivity, not to mention enhanced robustness, ease of use with laptops and acceptance of peripherals.

"More and more people are piloting Windows 2000," says Lawson-Shanks. "Once they start to see how effective and beneficial it is to run Windows 2000, the adoption will just be a natural follow-up."

Microsoft does all it can to make the upgrade easy: Windows 2000 allows users to upgrade from either Windows 95/98 or NT systems without reinstalling software, and it interoperates with backends on Unix, NetWare, Windows NT 4 or Windows 2000.

According to Lawson-Shanks, there will be no dearth of applications for those who upgrade. "Over the next eight months, every major application vendor will tout the fact that they run 2000 out-of-the-box," he claims. ▀

For the full text of this story, visit www.Windows2000Advantage.com.



ADVANTAGE

Compaq ProLiant-based Windows 2000 system smashes benchmark

By Jacqueline Emigh

Compaq's newly announced "eGeneration" Internet processing strategy got a big boost last month when a potent, 12-node Compaq ProLiant 8500-based system running Windows 2000 and SQL Server 2000 Enterprise obliterated the former TPC-C benchmark test record by some 67%, processing more than 227,000 transactions per minute. The old mark was held by IBM's RS/6000 four-node cluster. Compaq's 8-node cluster also distinguished itself by processing more than 152,000 orders per minute.

TPC-C measures a system's performance on a mix of five types of concurrent transactions. These include new order, payment, delivery, order status and stock level transactions.

Compaq's price/performance was also unparalleled, as the record-breaking system registered a rating of \$19.12 per tpm-C, a score 2.5 times greater than the closest runner-up. The tpm-C metric measures only the number of new order transactions executed by the system per minute. The reason for this is that new orders constitute the most frequent type of transaction in the real world. They also represent the most complex transactions.

In order to determine the price/performance number, the price of the entire system is divided by the tpm-C metric. For example, if the price of a system is \$859,100, and the tpm-C metric equals 1,562 per tpm-C, the price/performance number equals \$550 per tpm-C.

Speaking at the recent



Windows 2000 launch, Microsoft Chairman Bill Gates said of the new TPC-C champion, "It could handle all the e-commerce done on the Web during the last year in two days."

eGeneration is based on a three-phase strategy that leverages Windows 2000 and Compaq's dedication to meeting the rapidly expanding needs of e-business customers who must support massive numbers of users simultaneously accessing huge amounts of data.

Phase 1 began with the launch of Compaq's 8-processor ProLiant servers in August 1999. This phase also included the incorporation of leading-edge technologies such as multiterabyte storage, hot-plug capabilities and lights-out remote management capabilities.

Phases 2 and 3 are described later in this article.

"This is more than just a cool benchmark. It's a major proof point for an architecture

that will successfully address the dot com phenomenon," predicted Compaq's Vince Gayman, director of marketing for the High Availability Business Segment.

While Gayman says not every company is ready yet for the record-breaking 12-node cluster – which consists of 96 Pentium III Xeon processors working at 550 MHz – he notes, "There are many customers that will be facing demanding TP requirements. For some companies, Web site traffic for the 2000 Christmas season is projected to be three times higher than last season's. And you don't necessarily have to buy a big architecture right away. We've now demonstrated that, even if you start with a smaller system, you'll be able to scale out as far as you need to go." ▸

For the full text, visit www.Windows2000-Advantage.com.

The Web Magazine for IT Leaders

Implementing Windows NT and Windows 2000 with Compaq Services and Solutions

Point of View

Windows 2000 in virtual storage environments

By Dan Kusnetzky

Virtual storage is a model that describes the gradual addition of intelligence to a system's storage. Windows 2000 offers many features designed to support virtual processing. These features can be combined to enhance availability, scalability, performance and even system or network administration.

There are four categories of virtual storage:

Local Physical Storage (LPS) – the storage devices are directly attached to the local system. The system is aware of the characteristics of the storage devices and controls them directly.

Distributed Physical Storage (DPS) – the storage devices are attached to another system. The local system communicates with this remote system. The local system is aware of the characteristics of the storage devices and issues low-level commands to control them directly. Examples of this approach are the common internet file system (CIFS) or the network file system (NFS).

Local Virtual Storage (LVS) – storage devices are attached to a local storage server. The local system doesn't know the

physical characteristics of the storage devices attached to the storage server. The local system is made to see error-free, high-speed storage. The storage server optimizes storage performance, reliability and availability. The storage server may also allow systems running different operating systems to share the same storage devices. EMC, IBM, Storage Technologies and others offer these devices.

Distributed Virtual Storage (DVS) – storage devices are attached to a remote storage server. The local system is able to work with local storage or storage made available by a remote storage system. As with LVS, the local system doesn't know the physical characteristics of the storage devices attached to the storage server.

Why virtual storage?

It provides benefits, including the following:

- Centralized virtual storage can be managed by a smaller staff, lowering administration costs.

- Virtual storage can survive the loss of the original host, improving data and application availability. ▸

For the full text visit www.Windows2000-Advantage.com.

www.Windows2000Advantage.com

For more inside, hands-on Windows 2000 information, go to

GO

MARYFRAN JOHNSON

Spotlight on leaders

LEADERSHIP CAN BE an elusive quality to pin down. But we know it when we see it, don't we? It can be a single shining moment of victory over adversity. Perhaps it's an opportunity neatly seized, or a teachable moment well used. However it manifests itself, the single common thread is always

the human one. Companies don't lead. Technologies don't triumph. People do.

That was the uncomplicated theory behind our Premier 100 IT Leaders project, which led to the special supplement you'll find in this issue (after page 56) and greatly expanded at www.computerworld.com/premier100.

In years past, *Computerworld's* Premier 100 honored companies as leading users of technology, generally focusing on big, well-known corporations with gargantuan IT budgets. For the new century, we decided to make it personal.

We set out to define and identify IT leaders, to learn how they do what they do, and to figure out what makes them tick. We looked for people who are creatively managing their IT organizations, mentoring and motivating their staffs, envisioning innovative ideas and solving business challenges. They turned up everywhere, at some of the best-known companies in the world and at some of the more obscure dot-coms.

The project also led us to launch our first-



MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact him at maryfran.johnson@computerworld.com.

ever Premier 100 IT Leaders Conference, to be held June 19-21 in Palm Desert, Calif. The cornerstones of the event are a series of town-hall-style panels featuring more than two dozen of the "Premiers," discussing topics such as enterprise security, B-to-B e-commerce, ASPs, e-customer service and hiring tactics.

In our research, we developed a detailed profile of IT leader characteristics. We found that many of

them make decisions in a consensus style by soliciting input from direct reports. Yet the majority (77%) manage people in a "hands-off" fashion, delegating tasks and asking for occasional updates. They encourage debate and a lively — even contentious — exchange of ideas. The majority (73%) work for companies that were profitable last year, and their average IT budgets were \$229 million.

We are honored to introduce you to this crop of Premier 100 IT Leaders, and we welcome your help in nominating the next 100. Take a moment to look around your company. You'll know them when you see them. ▀

READERS' LETTERS

The good, the bad and the ugly: Article on proposed Microsoft breakup sparks debate

WITH ALL THE things the government has muddled up over the years, I was pleasantly surprised that Judge Thomas Penfield Jackson saw through Microsoft's FUD and issued a verdict that just might introduce competition into the IT marketplace ["DOJ Goes for the Jugular: Break It Up," Page One, May 1].

With Microsoft turned into two smaller, less-threatening companies, it is difficult to see how the operating system spin-off and the applications spin-off could continue to dominate the computer landscape with their buggy, third-rate product lines.

Thomas Barta
Evanston, Ill.

SINCE Patrick Thibodeau doesn't use the word *most* to report that "end users are largely skeptical of the government plan to split Microsoft," I suppose he's referring to the few people he selected to interview. If you are interested in evidence to the contrary, this end user of Microsoft products is largely hailing the recommendation to split as long overdue.

E. Escudero
Berkeley, Calif.

PATRICK THIBODEAU is clearly not talking to any of the IT professionals I know.

It's been my experience over the past couple of months that discussions both on the Web and in person have centered on how many companies Microsoft would be split into, not whether it should be split up or not.

The only people I have found who felt breaking up Microsoft

was going too far were either Microsoft employees or people who have a financial interest in Microsoft's monopoly. This sort of article makes me wonder about the independence of your publication.

It may be time for me to remove the *Computerworld* bookmark from my browser and to stop recommending your publication to my students.

Ross Rannells
Professor
Purdue University
West Lafayette, Ind.

IWISH everyone involved with the Microsoft case would take one giant step back and think: How did Microsoft get where it is today? Aside from the obvious issues before the court, it was due to its commitment to allowing developers to easily write applications that would run on its systems.

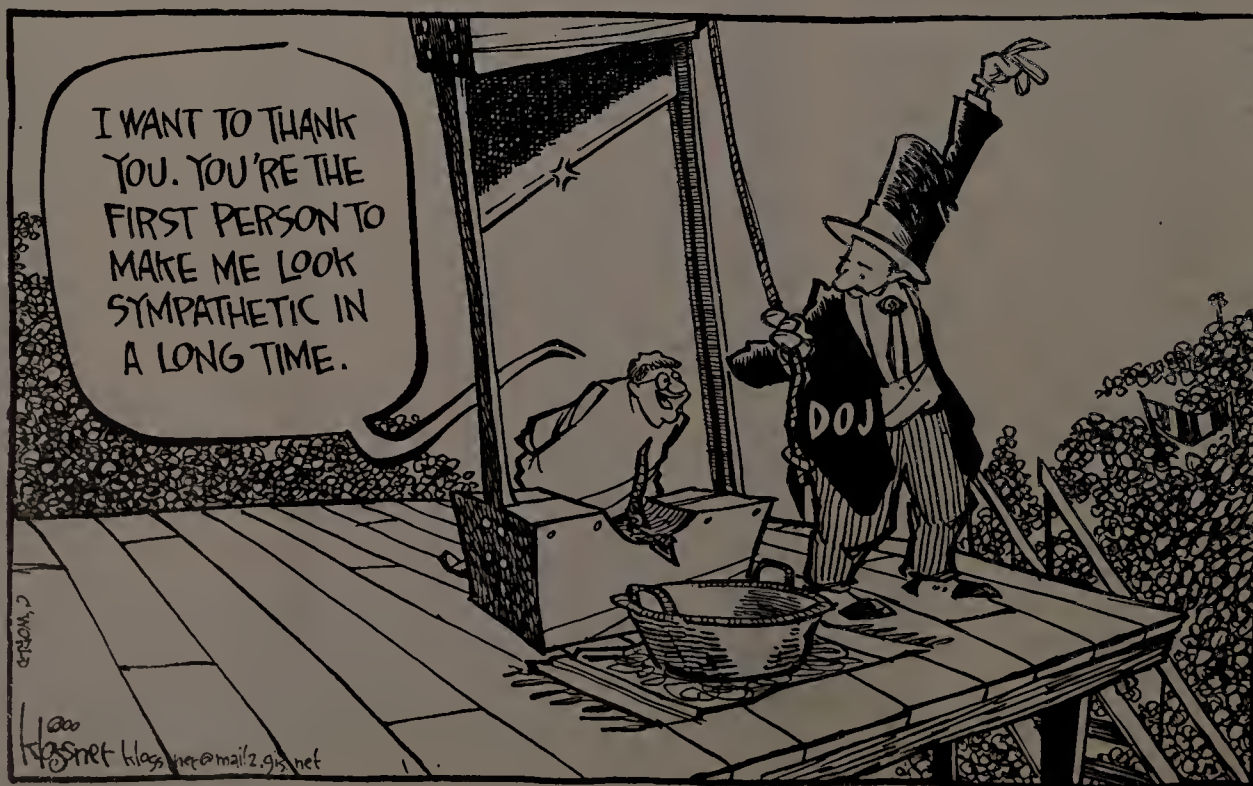
Splitting up the company will only make it more difficult to develop applications. Development tools *must* accompany any operating system; otherwise, the operating system itself becomes useless.

Let's fix the problem of how Microsoft competes, not what it creates.

Halden A. Totten
Vice president of IS
Community Home
Mortgage Corp.
Melville, N.Y.

More Letters, page 38

COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Jamie Eckle, letters editor, *Computerworld*, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

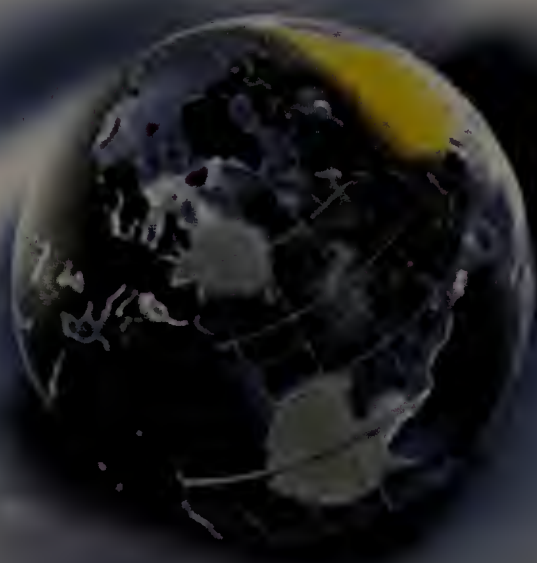


SPECIAL ADVERTISING SUPPLEMENT



MAY 8, 2000
White Paper

The
CALL CENTER
of Tomorrow
IS HERE TODAY



Introduction by
AberdeenGroup

COMPUTERWORLD
CUSTOM PUBLISHING

First we built the most advanced
MultiMedia Interaction Center on the planet.

Then we completely forgot to market it.



Maybe
we were too busy
perfecting our technical
capabilities. Perhaps we
were meticulously checking
the reliability of our technology.
Or maybe we were just out to lunch.

But while we weren't looking, the market
for more effective online customer contact
services exploded.

Not to worry though. We're up and running
and ready to help you grow your business
through better customer service, sales and
technical support built around your eBusiness.

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your web site.

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on the planet.

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ENABLING THE WEB

to Provide

HIGH-QUALITY CUSTOMER CARE

Author of
Chris Martins
Analyst
Aberdeen Group



The Internet is changing the dynamics of customer interaction by providing a communications infrastructure that is wide-ranging in reach and richness. The Web places demands on businesses to manage their customer interactions, which once were limited to toll-free telephone support. The ability to design business practices that accommodate the range of customer communication available through the Web is a large challenge for companies today.

Customer service in eBusiness isn't much different from the world of brick and mortar: Customers need service, and effective delivery of that service is a business mandate. In fact, the operational dynamics of eBusiness demand even greater customer care. The Web increases the number of customers that contact an organization.

In the rush to establish an online presence, eBusinesses may overlook an important component to their service options — personality. The power of human interaction — expressed in voice — can be an important element to a Web presence. Human voice conveys nuance, inflection, emotion and a range of other qualities that will influence customer interactions.

In addition to driving demand for customer care, the Web expands the options for how service can be delivered. Where organizations once were constrained to voice-based communications, the Internet allows communications to incorporate text messaging, eMail, collaborative browsing, natural language questions and answers, text searching and other forms of customer service. This palette of choices permits businesses to calibrate their service delivery based on business-determined practices, rather than provide generic service for every customer interaction regardless of importance.

Dividing and assigning service among the communication methods requires decisions about a number of criteria, which may include the following:

- **Product value and complexity** — High-value or complex products may warrant direct access to a customer service representative; inquiries about commodities can be fended off to self-service.
- **Product maturity** — Well-established products might have a "customer experience curve" that will accommodate self-service; new products or programs often need an active guiding hand in their early stages.
- **Customer value** — Customer qualification based on past transactions, demographics or other factors can influence the type of service provided.
- **Time of day** — While the Web is inherently 24/7, eBusinesses have practical staffing issues and may restrict direct access during certain hours, with self-service or eMail available for after-hours support.

The Web increases the communication choices for organizations, but as pianist Dooley Wilson once sang, in *Casablanca*, "The fundamentals still apply." Providing the right kind of customer experience is a key initiative for eBusiness success and for delivering high-quality customer care. ■

Chris Martins is a senior research analyst in the customer relationship management practice at Aberdeen Group. He focuses on the technology and solutions that provide sales, customer service and support via the Web, eMail and telephone. Headquartered in Boston, Aberdeen is a research and consulting firm focusing on identifying emerging and growing technology trends and the analysis of their impact on business.

In a MULTIMEDIA Interaction Center CUSTOMERS CALL THE SHOTS

By Johanna Ambrosio

Times have changed: What we used to refer to as a call center has now grown up to become the "multimedia interaction center."

This mature call center lets your customers control how — and when — they interact with you. For example, while they are surfing your site, they can hit a button on one of your pages asking you to call them or send them an eMail. Or they can ask one of your agents a question about your products by clicking on a live chat button you've incorporated into your site.

It's the best of all worlds, because customers are calling the shots.

Imagine being able to help your customer as he's surfing at 2 a.m. for that perfect Mother's Day gift — or when he's away from home and needs to get a refill on his asthma medication. A multimedia interaction center helps customers solve these problems by allowing the customer to contact you in various ways, including eMail, instant chat, video and voice over the Internet at any time from any place.

Mike McEwen, senior project leader at AppNet Inc. in Bethesda, Md., knows all about using integrated customer service technology. He helped the National Marine Fisheries Service (NMFS) implement a Web-based system for issuing federal fishing permits. The result, McEwen says, "is the customer gets to choose the way he interacts and the way he gets the permit — faxed to him, mailed to him, or he can print it out from the site." It's been an extremely successful rollout. (See related story on page 7.)

It's all about providing the best customer

care that technology can offer. And if you don't keep your customers happy, someone else will do it for you.

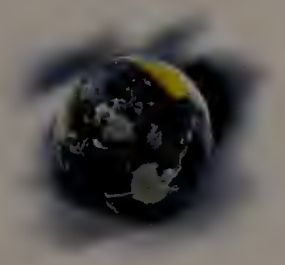
Bad customer service translates into lost opportunity, especially on the Web. Data-monitor in New York estimated that online retailers that were lacking adequate customer service lost around \$1.6 billion in 1998. Of the sales transactions attempted by consumers that year, 78% were abandoned. Part of the reason these sales weren't completed was because customers couldn't get real-time help with their problems.

No matter if you're business-to-consumer or business-to-business, the goal is to make sure customers have access to the channel most appropriate to the business they conduct. "If a customer wants to find out the status of an order, it's not efficient for them to call the salesperson," explains Jay Gauthier, executive vice president of Berkeley Enterprise Partners in Boston. "You probably want to have a Web self-service environment for that."

Companies are turning to integrated customer interaction centers to help provide instant access to information about their businesses, products and services.

However, making all this happen in real time isn't for the faint of heart. Many steps are required for implementing a quality customer interaction center, including:

- Re-engineering business processes. To do this, you must thoroughly understand your workflow.
- Building, implementing and managing the technical infrastructure, including the back-end telephone network, interactive voice response system, software to route and track voice and Web queries and managing it all.



- Training — making sure your customer service representatives are Web-savvy and understand the way that world works.

Building a world-class customer interaction center is "a major step for some companies to take on their own. You're getting into complex, sophisticated capabilities," says Rick Kent, vice president of The Phillips Group, a consultancy in Parsippany, N.J. This is particularly true at dot-coms that need to ramp up quickly.

A better alternative is to outsource your customer service operation to an expert who will understand your business, can answer your customers' questions and concerns, and shepherd and protect your customer data.

Ted Tannenbaum, operations manager at ProFresh International Inc. in Philadelphia, knows firsthand why outsourcing works. ProFresh makes a germ-killing mouth rinse. A dentist who created the formula founded the company but wanted to remain a dentist, and not go into the distribution business.

"We started with some people who answered the phones during regular East Coast business hours," Tannenbaum recalls. "Then we expanded the hours and added answering machines. But as sales went across the country, there was no desire to man the phones 24/7. So we outsourced to Target Interact."

ProFresh had several customer service outsourcers before Target Interact, but Target Interact has been by far the best, Tannenbaum says. "They're as good as if we were doing it ourselves, but we don't have the hassle," he says.

Target Interact, based in Salt Lake City, has been helping companies help their customers for over 30 years. Originally started as a telephone answering service, Target Interact is

now a state-of-the-art customer contact management center. Among the many flexible choices available from Target Interact are toll-free calls, inbound/outbound teleservices, interactive chat, voice over IP, digital fax, interactive voice response, consulting and fulfillment.

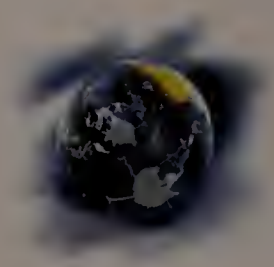
By combining a conventional call center with next-generation Internet solutions, Target Interact provides a customizable suite of customer support services, including help desk, technical support and sales. Target Interact can help year round or with a one-time special marketing or media campaign, depending on the company's needs.

ProFresh has taken advantage of both year-round and special-program options, Tannenbaum says. "We've done a publicity campaign that just blitzed the phone lines. Target Interact staffed up quickly and took care of it. We couldn't gear up that quickly internally," he says.

Outsourcing can help your company focus on what it does best — its business. But it's not a decision to be made and then walked away from. Successful outsourcing requires hands-on management.

"One of the concerns that businesses have is losing direct contact with their clients," Kent says. "So this activity has to be thought through."

Blair Pleasant, an analyst at the Pelorus Group in Raritan, N.J., agrees. "You have to make sure that the outsourcer really understands your products and services," she says. She recalls recently visiting a Web site with a call-back button. When she hit the button, "the person who called me could only refer me to someone else — the second person had to give me the information I needed."



The services Target Interact provides help alleviate the chance of that scenario happening. The company offers real-time text chat and voice/video over the Internet. It also provides live and automated eMail so that an eMail request doesn't sit in an in-box to be dealt with later. When eMail is distributed to an agent, it is treated like a live incoming call. A real-time pop-up window is displayed on an agent's workstation and is answered as soon as possible.

Target Interact's text chat provides a type of instant messaging capability. A customer on your Web site can ask questions in real time. He can click on this feature and immediately start a real-time messaging session with the customer interaction center agent.

While in this text chat session, the customer can escalate to voice and video over the Web if he has H.323-compliant Web telephone software, such as Windows NetMeeting, which is bundled with Microsoft Corp.'s Windows 95, 98 and 2000 operating systems.

Another strength of Target Interact is its "Brick-to-Click" integration. Target Interact's multimedia capabilities help its clients bring the brick-and-mortar side of the company together with the Internet. Many organizations develop their Web sites in a vacuum — not realizing that the tactile and the virtual sides of their operations need to be integrated. Target Interact links the interaction center to the brick-and-mortar side of the business as well as to the Internet.

Even with all the engaging and cutting-edge technology Target Interact offers, there are still some things to be aware of when looking at outsourcing your interaction center.

If an outsourcer such as Target Interact is going to represent you and talk about your products, services and even your corporate culture, make sure the outsourcer has all the

information it needs to do the job well. Make sure it has the most recent information possible about your products, services and corporate policies. You must treat the outsourcer like it's an extension of your company, because it is.

You need to be involved in how the outsourcer represents your business. Help the outsourcer develop the script to be used with your customers. Make sure the lines of authority are clear about what types of questions and issues the outsourcer will handle. It decides what type of questions get bounced back to your company. Will the outsourcer handle only new orders, or questions related to products? Will all problems or complaints be escalated to you, or do you want the outsourcer to take the first pass and then give you only the most serious issues?

Another tip from Tannenbaum: "Monitor your abandon rate and the length of time that the calls take. If calls are too long or too short, it might be partly a factor of what someone's calling for, and sometimes it's your script. You have to keep on top of this and make changes if necessary."

An outsourcer can be the critical link between your customers and your company. But at the end of the day, they're still your customers, which is all the more reason to treat them right by giving them the special attention an integrated customer care center can provide. ■

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Target Interact

In Action

AppNet, Inc. in Bethesda, Md., was the prime contractor for a Web-based application that helps people get federal fishing permits (www.NMFSpermits.com). One of the major pieces of the application is a customer service and fulfillment center run by Target Interact, a major outsourcer in the customer contact arena. We talked with Mike McEwen, senior project leader at AppNet, about the application and why Target was the best choice.

Q Give us some background about how the Web application for the National Marine Fisheries Service (NMFS) came into being.

A AppNet is an end-to-end Internet services provider. We help organizations with their Internet strategy and with online marketing, and we do hosting and systems integration. Back in April 1999, NMFS issued a request for proposal because they were unhappy with their permitting process, which was outsourced. There are certain species of protected fish that if you want to catch legally, you must have a federal permit. These include tuna, shark, swordfish and marlin. As part of this, NMFS has an enforcement staff that patrols the number of each species of protected fish that are taken from the ocean. They call their customers "constituents" — these are the actual fishermen, both recreational and commercial, who need permits.

The problem was that customer service was slipping between the cracks — constituents were signing up for tournaments and then not getting their permits in time and complaining. So the NMFS knew something needed to be done, and we were chosen to develop a new application — a Web storefront to buy these permits.

Q Tell us about the application.

A It was deployed in December 1999. There's the Web piece, where constituents can come to buy their permits. They provide a credit card and they can purchase their permit. The permit can, at their choice, be faxed or mailed to them — or they can print it out themselves. Or the constituent can send in a check to a lockbox, or call a phone number to order. All these methods use the same database, so it's all updated in real time. We also have an interactive voice response interface so that if an enforcement person is patrolling the docks and suspects some fish he sees on a boat, he can call into a password-protected part of the system and enter the boat's registration number. That way the agent can tell if the boat has a valid permit or not.

Q What's Target Interact's part in all of this?

A Target Interact handles all of the advanced customer interaction channels on the site — the chat and call-back buttons you see on the Web. And customer service is working out very well. There's a complex series of rules and regulations for different permit categories, with different deadlines. What's impressed us about Target is that they've become subject matter experts on the entire business process. They know what kinds of questions to refer back to NMFS, and they're great about referring questions. Then they follow up to make sure we actually respond to the customer. ■

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The Microsoft Recommendation

DAN KUSNETZKY

What could be Microsoft's future as 'Baby Bills'

THE JUSTICE DEPARTMENT and 19 states that brought Microsoft to court on charges that the compa-



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ny broke antitrust law have recommended that Microsoft be split into two companies.

"Baby Bill 1" would own Microsoft's operating systems, and "Baby Bill 2" would own Microsoft's applications, application development tools, database software, middle-ware, serverware, professional services, television and Web content and, finally, media (broadband and wireless communica-

tions). This, they say, will provide a remedy for the ills created by Microsoft's violation of the Sherman Act.

But it's not at all clear that it will.

First, Judge Thomas Penfield Jackson isn't obliged to abide by this recommendation. We won't really know what remedy he'll call for until he publishes his opinion. Microsoft has until Wednesday to offer its comments and could ask Jackson for more time. If Microsoft doesn't like the judge's final decision — and if hints of a breakup are in the air — it will appeal.

So, this opera won't be over until the Supreme Court sings.

Let's consider what would happen if Microsoft really were split in two. What would change? For the consumer, very little at first. For the Baby Bills, organizational chaos would reign for a year or two while they work out how to divide their physical and organizational infrastructures and produce products for other platforms. In the meantime, competitors would have a great deal of fun using that time to play the traditional game of FUD (fear, uncertainty and doubt). They would go to Microsoft's customers and paint a bleak picture about the future of its products — price, availability and support — in order to woo business.

It's clear that corporate IT organizations that are committed to Microsoft products will continue using them. After all, their end users know how to use them, and their support people know how to support them. The most important reason they'll continue using them is that they believe the products solve their computing problems for a price they're

willing to pay. The major differences they'd see for the first few years after a breakup would be that they'd have to write two checks rather than one to pay for their software and to negotiate with two firms, and possibly their competitors, rather than one. That would enhance competition, but on the downside, there will be many products to consider and many company reps knocking on the door.

Organizations not committed to Microsoft products would continue along their chosen paths. These organizations would simply take a split of Microsoft as further justification that their selection of non-Microsoft software was the right choice.

In short, nothing new would happen for a couple of years after the breakup.

Changes will start to occur when Microsoft's contracts with OEMs and channel partners come up for renewal. These partners will face the brave new world of competition. They will need to sort out offers from Applix, Corel, Lotus, Microsoft and Sun for personal productivity software. They will also need to sort out offers from IBM, Informix, Microsoft, Oracle and Progress Software for database and tools. Legato and Veritas would be happy to sell serverware solutions for Windows NT and Windows 2000, something that's difficult for them to do now because of Microsoft's contractual agreements and pricing policies.

Will Microsoft's partners continue to focus on Microsoft-only solutions? It's rather unlikely.

There's still a long road to walk before the final outcome, and Judge Jackson is the first stop on that road. ▀

JOSEPH G. MORONE

Has Washington launched an attack on best practices?

TEN YEARS AGO, the nation was awash in doubt over its ability to compete in global markets. *U.S. industrial competitiveness* was the catchphrase of the day.

The few companies that were able to successfully compete in high-tech markets — Motorola, Corning, GE, Hewlett-Packard and Intel — were celebrated as role models and benchmarked repeatedly.

What we discovered at the time was that these firms behaved differently. They exhibited a pattern of strategic management that, at the time, seemed strik-



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ing: They focused on relatively proscribed domains and then did absolutely everything possible to dominate in those domains — with the best-performing products at low costs, high quality and short product development cycle times. Their attorneys frowned on the use of the word *dominate*, but that's what they set out to do.

Perhaps the greatest irony in the government's prosecution of Microsoft is that the company was the most successful at practicing this form of strategic management during the 1990s. It built a strong early position in desktop operating systems, thanks largely to the emergence of the IBM-based PC as the industry standard, and then leveraged that dominance into equally strong positions in desktop applications of PC operating systems and, eventually, Internet-oriented applications.

On the surface, the Justice Department is attacking Microsoft's practice of bundling Internet Explorer with Windows, but in reality, it's attacking the very strategic management practices exhibited by the most successful American high-tech firms of the past two decades and, very likely, of the coming decade. Trying to prevent Microsoft from bundling Explorer with Windows is like trying to prevent Oracle from developing Web-enabled database software or extending its dominance in database software to enterprise resource planning applications.

The government has tried to justify its case against Microsoft by arguing that its business practices have harmed innovation. Considering that the PC-based world has been explosively innovative, the government, in effect, is claiming that if Microsoft hadn't been as dominant in PC operating systems, the incredible pace of innovation in the so-called New Economy would have been even more incredible. Remember: The government isn't actually claiming that the economy has been harmed; rather, it's making a much more hypothetical claim about lost opportunities for even greater benefits.

The key point is that all the available evidence about highly innovative high-tech firms indicates that they're innovative precisely because their strategic management practices are similar to Microsoft's. Moreover, it's entirely possible that the New Economy has been so explosively innovative not in spite of but *because of* Microsoft's dominance. The dominance created a de facto standard that becomes a platform for new waves of innovation. The Wintel standard became a known, fixed starting point for the thousands of firms pursuing new developments in the PC-based world.

In the end, perhaps the most telling evidence of the bankruptcy of the government's position is the simplest: Imagine that Netscape were a Japanese company. Microsoft's behavior, and its impact on innovation and the consumer, would have been no different. But rather than prosecuting Microsoft, the Clinton administration would probably have celebrated it as a paragon of industrial competitiveness. ▀

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The one about the tasteless joke some clown thought was funny. It wound up in an e-mail box that resulted in a \$2.2 million sexual harassment lawsuit.

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companies are liable and responsible for inappropriate e-mail communications between employees, regardless of whether or not the company was aware of the communication.

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malicious code. On the other hand, there are real ugly enemies out there.

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ALLAN E. ALTER

IT leaders require strategy, flexibility

STRATEGY is where IT leadership begins, Julia King reports in this week's Premier 100 special report. But where do you go from there? Jerry Miller, CIO at Sears, Roebuck and Co., has it right: What distinguishes an IT leader is the ability to take the right chances. That means sharpening your ability to think through strategic problems. It also means being prepared to take those chances. That re-



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quires a flexible IT organization and an equally flexible IT infrastructure.

Fortunately for IT leaders, much of the most important research and best new thinking focuses on how and where to take the right chances.

In the dot-com world, two key strategic approaches are emerging. One is "scenario planning" — the idea of working out several possible future situations and then

preparing yourself to capitalize on whichever scenario comes to pass. Another is "real options," an approach borrowed from the financial world that considers the possible returns an investment might have under various scenarios. A thinker pointing us in that direction is N. Venkatraman, a Boston University professor with a stellar reputation for his work in IT strategy. He says dot-com strategists should build upon their current business models by lowering costs and enhancing service — the sorts of things IT has traditionally worked on. But simultaneously, strategists should experiment with scenarios so they can uncover and reality-check new business models.

Sometimes strategic thinking requires new ways of looking at old products. John M. DeFigueiredo, an MIT assistant professor, has looked at where retailers should place their bets in e-commerce. Strategically speaking, the important distinction isn't what you sell but how buyers select a product, he says. The problems many Internet retailers are experiencing are the result of their having chosen categories given to commodity pricing and first-mover advantage, like books or CDs, or where brand reputation and the ability to feel and touch a product, as with clothing and furniture, are paramount for boosting profit margins.

Meanwhile, IT leaders should keep in mind the concept of "disruptive technology," made famous by Clayton Christensen's influential 1997 book, *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail* ["Fatal Attraction: The Dangers of Too Much Technology," IT Leader-

ship Series, June 16, 1997]. The Harvard professor showed that by focusing on the needs of their most technologically demanding customers, technology strategists can be blind to emerging technologies that might overturn their business models.

Scenarios, options, disruptive technology — all this argues for IT leadership that combines strategic imagination and flexibility. You need to place IT bets that will work, whatever the future holds. The way to thrive in e-commerce is to combine observations about customer behavior with these strategic principles and then create a technology base for experimenting with, and then exploiting, breakthrough ideas.

An example Miller might find interesting is FastFrog.com, a handheld shopping tool for teenagers from Clixnmortar.com. As teens shop in a mall, they can scan the items they want, creating a wish list that is downloaded onto a personal Web site and e-mailed to their families or friends. Interestingly, Chicago-based Clixnmortar is a subsidiary of Indianapolis-based Simon Property Group, a shopping-center developer.

Leadership, of course, remains bound up in character and insight. It's a skill, but it must be a skill serving a strategy. And it seems, as never before, serving a strategy you help create is what leadership is about in IT. ▀

THORNTON MAY

Escaping the 'privacy protectors'

I'VE BEEN SPENDING time with senior managers in corporate IT for 17 years, and one thing that hasn't changed is that technologists are always being blamed for something and hunted by someone. I've made a career of being a vocal friend to CIOs as they become subjected to the assaults of non-IT people who just don't understand the complexities of managing IT in a corporate environment.

In the late '70s, CEOs were angry with CIOs because they weren't aligned with the business. In the early '80s, CFOs were upset with CIOs because the then-aligned systems cost too much.

In the mid- to late '80s, COOs were upset with CIOs because business processes had to be re-engineered before they could be automated. In the early '90s, outsourcers took a spot in the queue of complainers, kvetching that doing certain things inside was inefficient. In the mid-'90s, the marketing department jumped in and said the in-place infrastructure wouldn't

support real-time customer interactions and Web activity.

My millennial resolution was that the next set of people who started beating up on CIOs was going to get criticism from me. Sure enough, a new group of finger-pointers has emerged: privacy protectors — individuals and organizations claiming that corporate America in general and corporate IT in particular are violating our rights to privacy. My initial reaction was to attack these new voices. In my mind, I positioned these privacy mavens as neo-Luddites. I demonized these folks as a bunch of left-behind-by-the-New-Economy data-huggers who were just upset that they didn't have large chunks of pre-IPO stock.

I've been counseled to channel my save-the-CIOs energy into a better understanding of who these people are and what they're saying. The radical fringe of the privacy movement (I call them "diginistas" because of their tendency toward disruptive and semi-illegal underground activity) has targeted interactive, focused-on-the-customer, Web-based computing. They'll break the law to save our privacy.

Alongside these privacy-at-any-cost, one-issue ideologues are the "litizants" (the z stands for zealots). They are citizens sensitized to privacy issues who will sue anyone and anybody whom they believe has stepped over the line. But this line, as it now relates to privacy, is ambiguously defined by society.

How the mainstream (i.e., citizens and consumers who are only minimally aware of privacy) deals with, reacts to and resolves this "ambiguity" will greatly affect the future practice of IT.

The chief privacy issues that privacy protectors point out include:

- Growing public concern over privacy.
- Legal change moving much slower than technological change.
- Disparate databases being integrated.
- Databases becoming the tool of choice to fix social problems (e.g., Have a teen crime problem? Or a deadbeat parent/child-support problem? Create a database).
- Databases with good intentions going in can be repurposed for surveillance.

The corporate IT community must step up and address these issues before the government steps in and does it for them. The worst-case scenario has privacy activists succeeding in passing legislation around "managing customer data." The emerging consensus in corporate IT is to no longer focus attention on what computer to buy; rather, high-performing organizations are focusing on the much more relevant question, "What kind of computer should I be?" Increasingly large amounts of IT budgets are being devoted to processing customer information.

What irony! Computer people are finally invited to sit at the big table in the big house for the big economic game, and unless we proactively show how we have customers' permission to assist them in their data management initiatives, we could be shut down. Unless we're able to prove that our collection of data serves rather than threatens, we face a very scary future of government intervention and creativity-stifling regulation. ▀



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READERS' LETTERS

Take a broad view of Net markets

THOUGH JULIA KING'S "Businesses Weigh Pros and Cons of Web Marketplaces" [News, March 13] was a well-balanced article, the sources cited may have provided a shortsighted view of Internet markets.

For example, Mark Chellis, a vice president at Wilson Supply Co., says his company already offers at no charge the order and sales summary reports that digital marketplaces plan to charge money for. Another source said outsourcing sales-reporting services to a third party doesn't make sense.

If this is all you're looking for, these opinions deserve merit. The real value of today's Net markets lies in their unparalleled ability to provide a total market perspective. Companies that participate in a Net market can not only receive an accounting of sales but also a report comparing actual sales vs. missed opportunities. Online markets

are becoming more sophisticated every day, as this example shows.

Jacob Pechenik
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Digital signatures defined

THE DEFINITION OF digital signatures in the April 10 issue was not completely correct [Business QuickStudy]. A digital signature is a hash value encrypted by the sender's private key.

The sender sends the digital signature with a message. The receiver decrypts the signature with the sender's public key. The receiver then calculates a hash value and compares it with the decrypted signature (hash value). If they match, it proves that the message was not tampered with and proves the identity of the sender, be-

cause only the sender has the corresponding private key that encrypted the hash value.

A digital signature does not encrypt the message and therefore does not provide confidentiality, as stated in the article. That is accomplished by other means, such as Secure Sockets Layer. A digital signature offers data integrity, nonrepudiation and identity.

Mario Rotante
Information security officer
Identrus LLC
New York

Palms vs. Pocket PCs: Happiness is in the hand of the beholder

I REALLY GOT A KICK out of "PDAs at 30 Paces" [Technology, April 24]. I think that both the Palm products and the new Pocket PCs are great.

However, like the argument over buying a minivan or an SUV, it really depends on the person.

I purchased a Handspring Visor Deluxe about a week ago and returned it for the Hewlett-Packard Jornada 545 a few days later. I found the Handspring to be well made and very simple to use, but something was missing — color. Sixteen shades of green simply isn't enough to provide the detail necessary to view a map.

Despite some apprehension about spending double the amount, I purchased the HP Jornada 545. In the week that I have had this product, I have been amazed. The screen can be easily seen in bright daylight and at night. Since the screen is where the keyboard/writing tool pops up, it is easy to use when there is no light. I didn't think I needed an MP3 player, but after recording some CDs with the new version of Music Match at 160K bit/sec. oversampling, I was very impressed with the results.

Sorry, Mathew Schwartz, but I think that Russell Kay is right: The new Pocket PCs are fantastic.

By the way, I bought the SUV.

Peter Shapiro
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HOW MANY Windows CE hardware vendors would be supporting it if not for the coercion of a convicted predatory monopolist? Windows CE is a bad product.

But it's OK; Microsoft can make a bad product — in fact, it often does. The problem is finding a publication with the guts to say so.

William Fairbanks
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Message is clear on privacy issues

THREE CHEERS FOR Patricia Keefe's March 27 editorial on privacy ["Privacy: Fight for It," News Opinion]! We must continue to send a clear message to IT professionals about the importance of responsibly protecting privacy.

Recently, I gave a talk on privacy to a local group of non-IT professionals. The audience broke into small groups to look at the subjects of medical records privacy, airline security/profiling and Internet privacy. The groups reported that they highly valued their privacy, though they were willing to compromise somewhat to ensure that air travel was safe; that they wanted the right to opt-in on the release of all medical information; and that they expect the Internet industry to police itself and protect confidential information.

I believe the message is clear: It is up to IT professionals to maintain the highest integrity when it comes to protecting confidential information. Perhaps the government won't touch this thorny subject, and others in the organization might have big ideas for the use of confidential data. But perhaps some responsible messages from IT will help shape better policies for technology-enabled organizations.

Mark L. Roch
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Collaboration is key for IT workers

WITH MIXED EMOTIONS I read David Foote's column about the future of IT ["Consulting Skills Will Help Tech Pros Survive as IT Fades," News Opinion, April 17]. On one hand, I applaud his suggestions to stay flexible and prepare for an uncertain future. However, if the business world succeeds in ditching IT departments as a fad or merely to cut costs, business will suffer in the long run.

An individual with technical or analytical skills who must work in isolation will sorely miss many of the advantages gained by working in a functioning IT area — mostly the IT people themselves. The interchange of ideas, methods and especially disciplines at technical, project, analytical and interpersonal levels is invaluable for an IT professional. One cannot hope to become proficient and stay up to speed while working exclusively outside such an environment.

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BUSINESS

MERGER OF EQUALS

Last June, Honeywell and AlliedSignal announced that they would merge. Integrating the two industry giants' IT was a mind-boggling project that melded people, processes and technology. But the companies managed to do it in just six months. **42**

REVERSING A TREND

A number of recent court decisions, most notably the Cyber Patrol and DVD cases, have limited the use of reverse-engineering, a move that critics say will hurt U.S. software development and, ultimately, users. **46**

HOW SWEET IT IS

ECandy.com, an online confectionary retailer, is using technology to solve the customer service problems the company's founders say have traditionally plagued the industry. And with online gift-candy sales still below their potential, industry leaders say eCandy.com might be jumping in at just the right time. **47**

SPREADING THE WORD

BeVocal Inc., a new service set to launch this summer, provides stock quotes, driving directions and traffic and weather reports via Web, fax, phone or handheld computers. What's it like to work at this Santa Clara, Calif.-

based company? Co-founder Mikael Berner tells all. **50**

PRIVACY RULES

DoubleClick learned the hard way just how much consumers value their privacy, when the company's stocks plummeted earlier this year. Companies can avoid similar disasters by being more up front about their data collection policies and giving customers a say in the information being gathered about them, say e-commerce experts. **57**

A NEW LOOK

What does today's successful techie wear to work? How do you achieve a look that's both professional and casual? Some of the nation's top fashion consultants give the low-down on how to dress for success in 2000. **58**

KEEPING PACE

Businesses are quickly learning that annual and monthly financial reports just aren't sufficient in the fast-paced world of e-commerce. To keep up, companies are turning to real-time reporting. **64**

TEAMWORK

For online businesses to succeed, IT and business staff need to come together and start a dialog on e-commerce and customer relationship management, writes Peter G. W. Keen. **50**

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PAUL S. RAINES, VICE PRESIDENT OF SECURITY at the Federal Reserve Bank of New York, says that with the recent distributed denial-of-service attacks, "everyone else had to pay a price because others weren't maintaining good security on their sites"

GUARDING AGAINST ENEMIES

AS BUSINESSES JUMP into e-commerce, they face threats from the very technology that's helping them move forward. A panel of security experts, moderated by *Computerworld's* Kevin Fogarty and eBizChronicle.com's Sarwar Kashmeri, warn of the risks that exist and offer advice about how companies can protect themselves from attack.

'One Plus One Equals One'

How Honeywell and AlliedSignal merged IT, with 90 days to plan, 90 days to do it

BY JAMES COPE

AS BILL SANDERS AND Jack Arnold walk out of a company information technology meeting in Phoenix, they seem at ease with each other — like old friends or classmates who have known each other for years. But less than a year ago, they never dreamed they would someday work together.

Sanders was CIO at Minneapolis-based Honeywell Inc., a global provider of industrial controls, facilities systems controls and avionics. Arnold was a senior IT executive at AlliedSignal Inc. in Morristown, N.J., a manufacturer of flight safety products, automotive products, specialty chemicals and performance fibers, plastics and advanced materials.

Now they both work for the new Honeywell International Inc., a global conglomerate created when the two companies merged last year. Sanders is a corporate vice president and worldwide CIO at the new Honeywell. Arnold is corporate vice president for common and companywide systems, reporting to Sanders.

Mergers happen every day, but not usually on this scale. The new company has 126,000 employees worldwide, and the combined IT departments account for more than 3,000 of them.

Even the business integration team had 1,200 members, according to Ray Stark, who was put in charge of the team after the merger was announced last summer. He's now corporate vice president of Six Sigma (a quality assurance program) and productivity at the Morristown-based company.

Stark said he had known the merger was in the works. He had been asked by now-retired AlliedSignal President and CEO Larry Bossidy to be the business integration leader. But he said he didn't hear that it was "a go" until "around 10 p.m. on Sunday," June 6, 1999. The merger was announced on June 7.

Stark had his work cut out for him. He was determined to combine the companies in a way that would minimize expense and maximize revenue.

And then there was the urgency. "We were on a 90-day time line," Stark said. "From the time of the announcement to the time the merger closed, I had no life. It was the summer that wasn't."

The Promise

The foundation for integrating the IT departments grew from the basic strengths that both companies identified at the time of the merger announcement, Sanders said.

On the AlliedSignal side, "there was a very strong set of operating disciplines," he said, "including an advanced Six Sigma culture, a broad business portfolio, a lot of capital and cash-generation mechanisms, and a focus on product engineering and manufacturing." AlliedSignal also had a "superb internal focus on product improvement," he added.

Honeywell was more of a systems-

and solutions-based company, Sanders explained. Moreover, "a very high percentage of Honeywell's business was global," he said, and was built around the Baldrige quality-criteria model. The model's balanced orientation brought a strong external customer focus to the merger table, Sanders said.

The Challenge

There were also several overarching business challenges that affected IT integration, Sanders said.

For example, there were two business structures. Honeywell was more decentralized than AlliedSignal. And AlliedSignal's business unit structure was often based on global regions, whereas Honeywell had more of a regional matrix structure.

Then there was the matter of bringing together people from different corporate cultures. "It's one thing to say that you're going to bring these people together, but it's another to mesh them together and get a good balance," Sanders said.

Fortunately, AlliedSignal "had a fair amount of experience of acquiring and integrating companies," Arnold noted. "We decided to use the processes that Allied businesses and IT had used in the past."

The sophisticated process and control mechanisms used for Y2k were applied to IT integration, Arnold explained. And fortunately, "most of the [business units in Honeywell and AlliedSignal] had already fixed their [Y2k] stuff before the merger happened."

Speed was one of the prime guidelines for integrating the two IT organizations, according to Sanders. He was convinced that speed would provide intense focus on the tasks at hand and help minimize the natural anxiety that comes with change. So he set a goal of three months for planning and another three months for implementation.

Merger of Equals

In many large mergers, one company often dominates. But Sanders said there was no room for such thinking in the Honeywell and AlliedSignal merger.

"Going in, we held to the principle that this was going to be a merger of equals and that we were going to retain the very best people wherever they came from," Sanders said.

The same was true for IT processes. Establishing the concept of equality from the beginning defused any negative ruminations, Sanders said.

And although there was a broad focus on controlling cost structure and not just head count, Sanders said, the companies started with the simple concept of "one plus one equals one" — meaning that the final IT organization could be no larger than the sum of IT

From the time of the announcement to the time the merger closed, I had no life.

RAY STARK, VICE PRESIDENT,
SIX SIGMA, HONEYWELL



Merging IT

To create the new 126,000-employee Honeywell, representatives from AlliedSignal and Honeywell formed 20 integration teams that focused on blending the best from each company's IT department and scrapping the worst. They concentrated on the following major categories:

- Infrastructure
- Global operations
- Finance
- Applications
- E-commerce
- Organizational strategy

personnel in the two companies.

"We made sure we had a blend of people on every team, from both Honeywell and Allied. We also mixed up leadership of teams between the two companies," Arnold explained.

Sanders didn't specify how many IT staffers left as a result of the integration. But he did say that a senior IT manager left to take a higher-level position at another company.

Some of Honeywell's IT workers in Minneapolis "didn't want to be relocated," Sanders said. The company had an excellent severance plan, he added, and some people in that city had two or three years of salary coming to them. With only a 2% unemployment rate in Minneapolis, some could easily "switch directions"; others simply decided to retire, he explained.

'Tough Guys'

Still, there's always some anxiety in the air when different cultures come together, Sanders said. The Honeywell employees came from a fairly decentralized organization, whereas AlliedSignal was more structured.

The Honeywell IT staff may have thought, "I don't want to work for a bunch of tough guys," Sanders said. And the AlliedSignal staff may well have imagined, "We'll lose our edge by mixing in with these Honeywell people," he added.

But, according to Arnold, when the two IT project teams started meeting, people from both sides discovered more similarities than differences.

There were 20 IT integration teams in all, Arnold said. Each had a well-defined scope, deliverables, target dates and communication and reporting processes.

The teams covered six major areas: infrastructure, which included telecommunications and computing platforms; global operations; finance; applications; e-commerce; and organization-

al strategy. The latter team was aimed at putting people in the right places within the merged corporation.

Sanders continued to preach the melding of business strategies, so it followed that he would opt for a consolidated IT operating plan that retained the strengths of each company's separate plans.

"We focused a lot on resolving differences," Sanders said. "There was no ripping things apart. We didn't want to disrupt business and spend money just to get sameness."

For example, Honeywell preferred SAP AG's enterprise resource planning (ERP) software, whereas AlliedSignal used Oracle Corp.'s products. But Sanders insisted that the two companies not quibble over it.

The result was a blended ERP, Sanders said. The merged corporation's aerospace, automotive and chemicals businesses use SAP, and the industrial businesses run on Oracle.

The companies also elected to maintain what Arnold described as a dual-technology strategy for e-commerce.

"Sun/Netscape was Allied's basic strategy," he said. "Honeywell's was Microsoft. We decided it didn't make sense to throw one out for the other. The advantage of Sun/Netscape is openness. The strength of Microsoft is a large installed user base."

Overcoming Obstacles

In the middle of project planning, the European Union threw the IT integration teams a curveball. The company would have to divest some of its aerospace holdings before the merger could move forward because the EU felt the duplication of aerospace elements in the two organizations could raise anti-trust issues.

To minimize disruption, Sanders decided to stop integration work on aerospace systems but to proceed full bore with the integration of the other businesses. Aerospace wasn't outside his consciousness, he said. "We just had to keep it to the side of the table" and in some cases "extrapolate what we would do once the divestiture issues were resolved," he explained.

"Once aerospace was ready to go," Sanders said, "we were able to get through integrating it in 30 days."

Europe also presented another problem: AlliedSignal had a data center in Scotland, and Honeywell had one in France. "Neither was willing to fall on its sword," Sanders said.

"We had to back away and look into the high-level economics," he added, explaining that he decided to keep both open for the time being but will look into the long-term option of outsourcing the infrastructure.

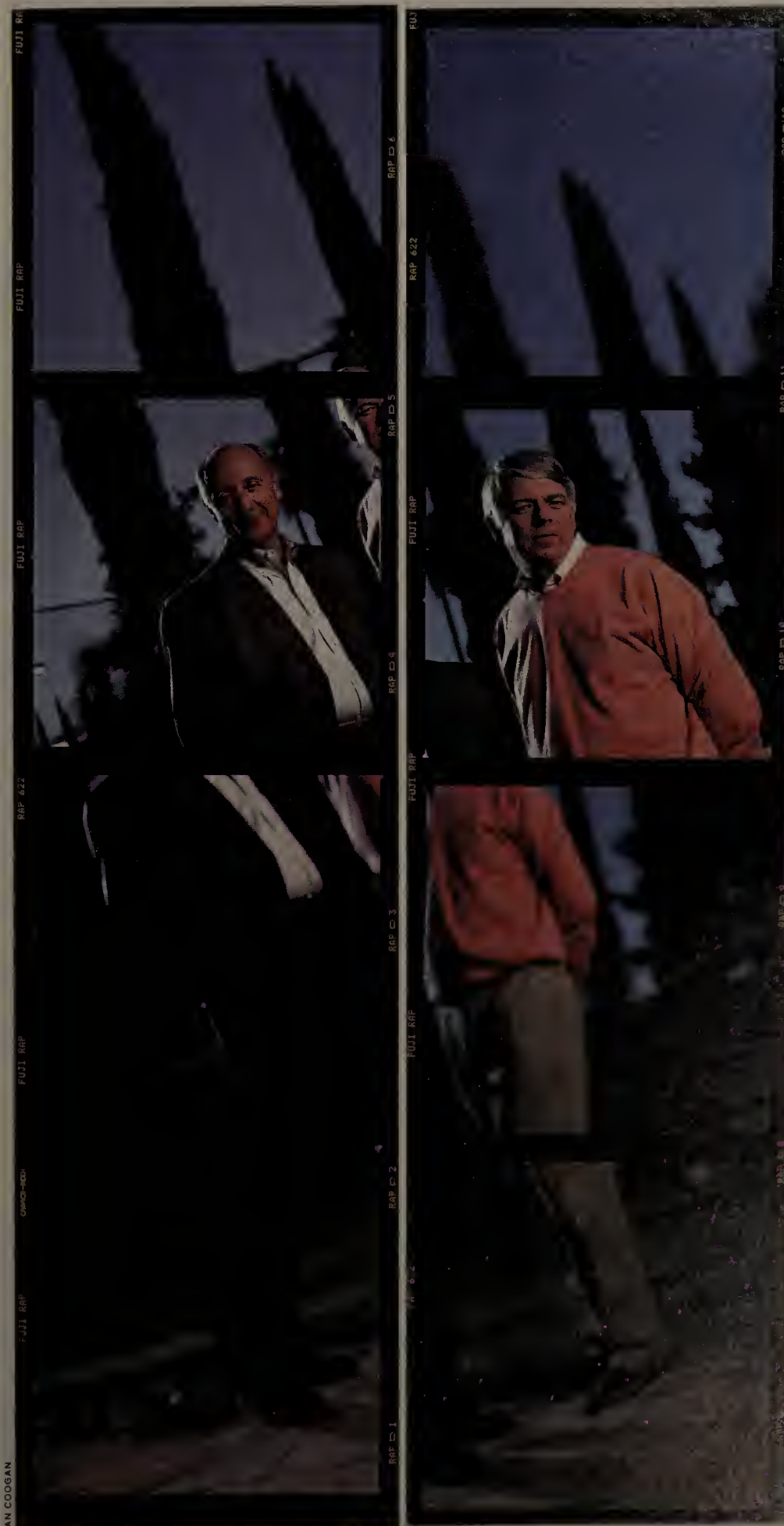
"As leases on facilities expire, the economics of this approach make sense [globally]," Sanders said.

The Honeywell and AlliedSignal merger was finalized Dec. 1. Honeywell Chairman and CEO Michael Bon-signore said the new company is well positioned to realize \$250 million in merger-related savings this year against its three-year target of \$750 million.

"It's still a little too early to tell," said aerospace analyst Paul Nisbet at JSA Research Inc. in Newport, R.I. "But the

merger appears to have gone very well. I don't think you're going to see [Honeywell and AlliedSignal] stumble like Lockheed and Raytheon did."

Wall Street seems equally pleased with the outcome of the merger. "The new company is off to a good start," said Phua Young, an analyst at Merrill Lynch & Co. in New York. "So far, so good. We're happy with earnings and growth." ▀



HONEYWELL VICE PRESIDENTS Bill Sanders (left) and Jack Arnold say the new Honeywell was formed by combining the best features of the old AlliedSignal and Honeywell

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Battle Brews Over Reverse-Engineering

BY ANN HARRISON

Recent court decisions limiting developers' rights to reverse-engineer software have sparked

an outcry by critics who say these actions could severely limit developers and users trying to interoperate or find flaws

in commercial software.

U.S. judges have recently ruled that unauthorized re-engineering of the digital video

disc playback system and a Web filtering program called Cyberpatrol violated copyright and trade-secret laws.

Reverse-engineering is also forbidden by many shrink-wrap license agreements. This

restriction will likely be strengthened by the Uniform Computer Information Transactions Act (UCITA), which gives vendors powerful leverage in contract negotiations.

While some software vendors and content owners insist these decisions strengthen intellectual property protections, developers and system administrators argue they are losing the right to use products as they wish.

"Clearly, if we are not allowed to reverse-engineer... then we have no control over what software is running on the computers we own," said Ian Goldberg, chief scientist at Zero-Knowledge Inc. in Montreal. "Bugs, security holes or worse, explicit back doors, might be undetected, but only talked about within the bad guys' community. Disclosing the information would be illegal."

Fair-use provisions in the copyright laws that permit reverse-engineering have spurred the development of software that competes with proprietary applications such as Microsoft Word and Excel.

Richard Smith, a former developer at Cambridge, Mass.-based Phar Lap Software Inc., who now evaluates software for privacy holes, said UCITA gives companies legal backing to enforce reverse-engineering bans in shrink-wrap licenses that might not otherwise be enforceable.

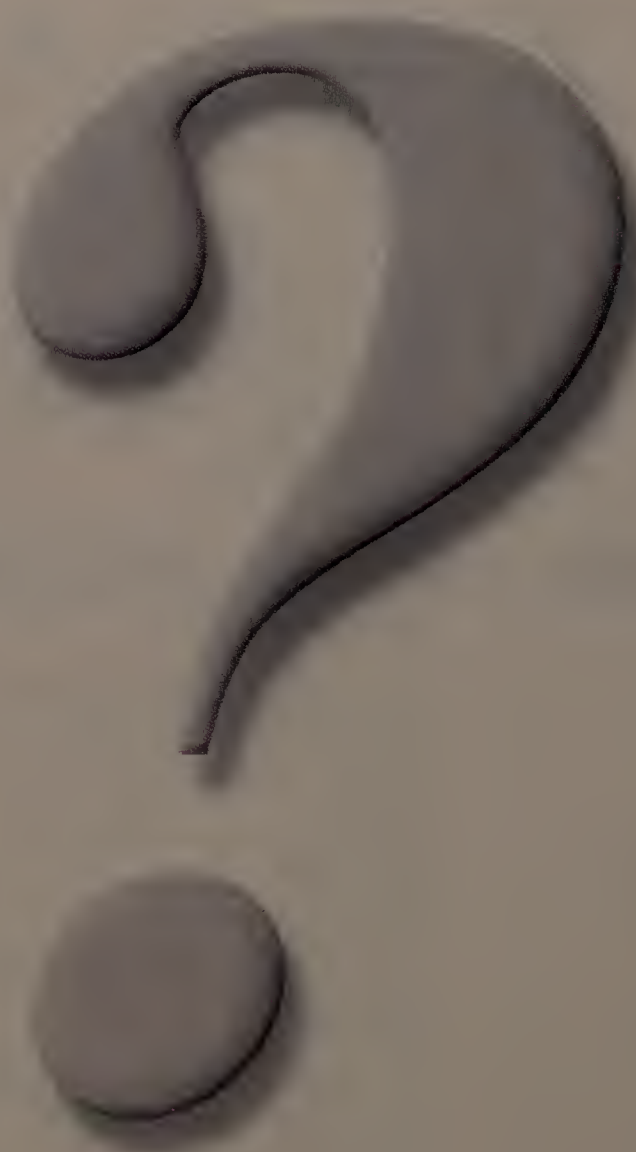
Meanwhile, some developers are moving their reverse-engineering projects offshore to avoid U.S. rules.

"There are rather insane laws in the U.S. about reverse-engineering, and so we sidestepped those by having the work done in Europe under the European Union fair-use laws," said Jeremy Allison, a software developer at VA Linux Systems Inc. in Sunnyvale, Calif.

Allison co-authored Samba, a Windows file-serving program that allows Unix machines to serve file-and-print services to Windows clients.

Allison said his team is forced to reverse-engineer because Microsoft doesn't offer documentation of its proprietary protocols. But when the Samba team decoded the Microsoft domain controller protocol to allow Samba servers to interoperate with Windows NT, they made sure the work took place outside the U.S. ▀

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Net Sweetens Business for Candy Sales

BY TODD R. WEISS

When eCandy.com Inc. went online last November, its goal was to do more than merely satisfy the occasional sweet tooth.

The Los Angeles-based company also sought to bring new ways of doing business to the \$23.5 billion U.S. retail confectionery industry, said co-founder Rani Aliahmad.

"I wouldn't use the word *revolutionizing*," he said. "ECandy is really *evolutionizing* the industry."

Aliahmad and eCandy.com co-founders John Hadl and David Kim didn't have any prior experience in the confectionary business when they founded the company early last year. But they decided to bring their technology and business backgrounds to an industry they felt was "a little dysfunctional."

"You can have a great candy out there, but there's no way people are going to know about you" because of industry domination by a few large manufacturers, Aliahmad said. And, he added, the industry has been unwilling to adjust to shoppers' evolving tastes.

"It's a push economy rather than a pull economy — not consumer-driven," he said. "You change that by bringing the manufacturers closer to the consumers."

ECandy.com claims to do that by focusing strictly on online distribution and paying attention to the customer, Aliahmad said.

One simple way eCandy.com taps into its customer base is by reading e-mail from customers suggesting new products, said Aliahmad. The company then passes those suggestions on to manufacturers.

But Stephen Traino, president of San Diego-based Candy Direct, an online candy distributor founded in 1997, said such strategies are nothing new. ECandy, he said, is just one of many sellers in a large market.

Industry analysts say the future of the online candy business has yet to be proved.

Food analyst Mitchell Pinheiro at Janney Montgomery Scott LLC in Philadelphia said businesses like eCandy.com will likely find their greatest success in gift candy sales,

since the Internet can't instantly satisfy sweets-craving shoppers.

Susan Fussell, communica-

tions director at the National Confectioners Association in McLean, Va., agreed.

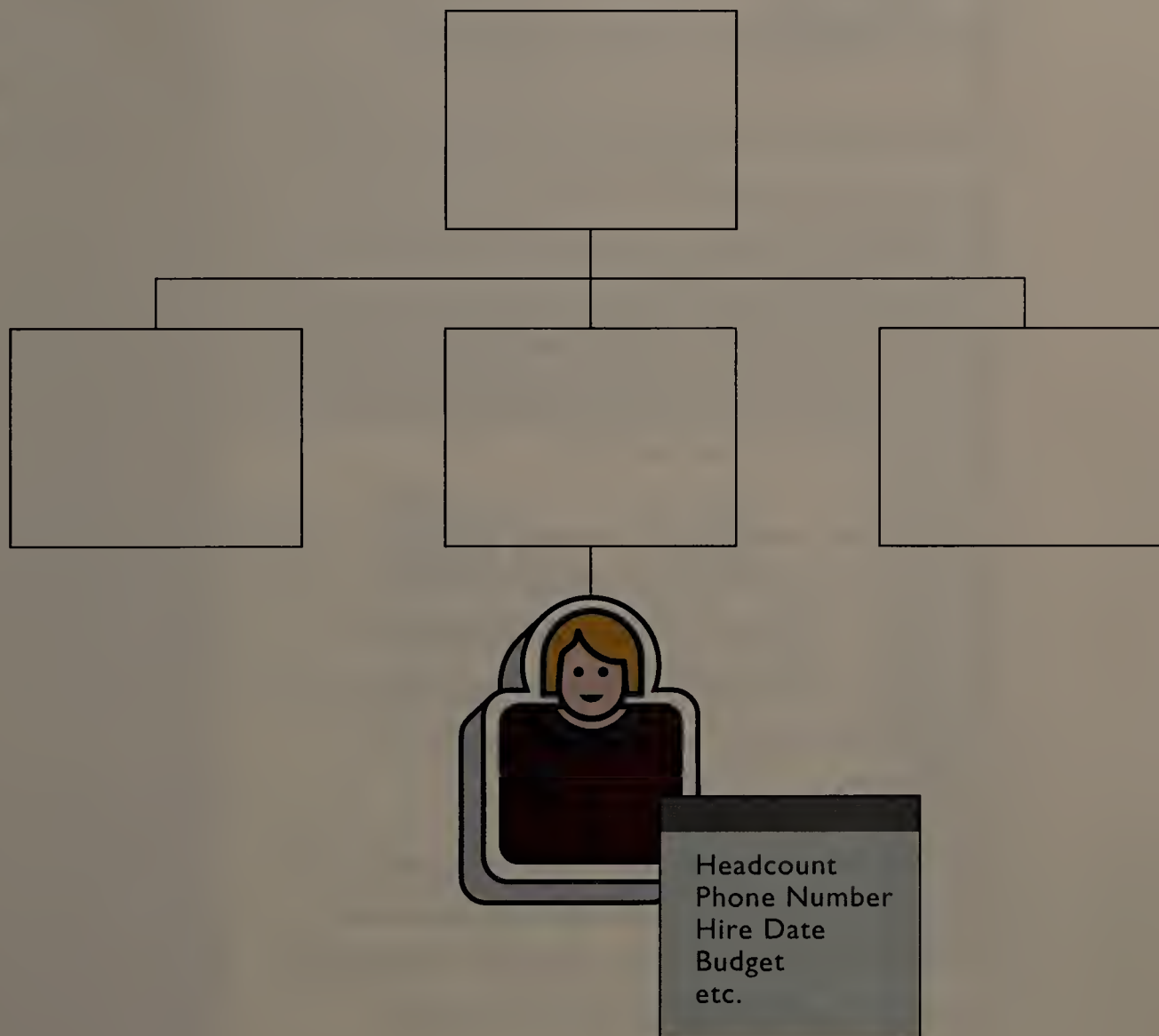
According to the associa-

tion, up to \$2 billion of U.S. candy sales in 1998 were earned through mail order or online sales.

"The Internet is so far only a small part of the mail-order market," she said. "There is

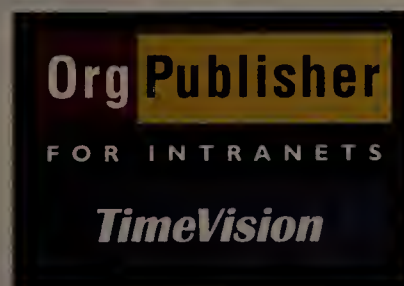
definitely room for growth. ECandy knows that, and that's why they've looked for these niches." ▀

Weiss is a freelance writer in Lancaster, Pa.



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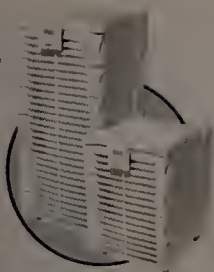
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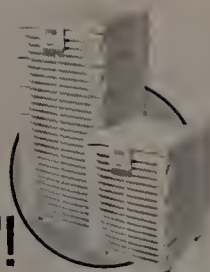
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WORKSTYLES

What It's Like to Work at . . . BeVocal Inc.

Interviewee: Mikael Berner, chief technology officer and co-founder

Company: BeVocal Inc., a real-time, interactive voice portal service that provides information such as driving directions, traffic and weather reports, stock quotes and flight information. BeVocal was founded March 1999. The service is in beta-test mode with 800 users; the formal launch is scheduled for this summer.

Location: Santa Clara, Calif.

Number of information technology employees: 45

Number of employees (end users): 60

Underlying technology: "It starts with a sea of servers that integrate telephony and IP technology — we're like a combination of a phone company and an Internet company." The architecture, dubbed the Vocal-Boost Platform, supports common services such as caller profiling, call monitoring, audio advertisement insertion, e-commerce transaction billing and settlement, security via voice-print verification and various content delivery methods, including voice, e-mail, fax and wireless application protocol.

What skills do you look for? Network managers, Java programmers and people with speech experience, such as a background in linguistics.

How do you make money? "Revenue starts with product placement and ends in a sale. For example, if someone getting flight information wants to make a reservation or book a rental car, they can act on that immediately, and we make a cut on the transaction."

Who's your competition? "There are a few other start-ups looking to do the same thing we're doing, but we're mainly worried about the phone companies. They own the infrastructure, and they've been looking at speech recognition for a long time."

Workday: "IT tends to get cranking about 10 or 11 a.m. and works about a 12-hour day. But we're a little busier now because we're preparing for the launch. A normal day is 10 hours."

Dress code: Casual. "There seems to be a Hawaiian theme going on — a lot of loud shirts. And we have a Java programmer who shows up in full motorcycle leathers."

Employee reviews: Every six months.

Bonus programs: "We have an ad hoc bonus program based on effort and accomplishment. . . . Also, people don't realize when they're working too hard, so we award them with time off and partial pay-

ment for a trip."

Kinds of offices: "We're in cubicles, and the space is divided into what we call 'vocal studios,' and we're naming them after famous vocalists. Nominees so far are Frank Sinatra, Barry White, Jimmy Buffett. We have one area designated as the Vocal Boost Café and we have a War Room."

The War Room? "That's where we meet daily to make sure that IT and marketing and sales are coming together for the launch. The motto on the door is, 'Try not. Do . . . or do not. There is no try,' by Yoda in *The Empire Strikes Back*."

Decor: "The walls are purple and red [the corporate colors] and we have orange pillars throughout. . . . The pillars are concrete with steel reinforcement, but our CEO managed to put a huge dent in one during a backwards-chair race."

Number of employees who telecommute: "We have three telecommuters who live in other parts of the country. . . . But it's not something we encourage in our recruiting."

On-site day care? No. "I have twin girls, so I wish we did."

In-house cafeteria/food service: Free sodas, coffee and junk food. Free dinners when people work late.

The one thing everyone complains about: "The amount of cell phone minutes they have. [Each employee gets] 500 cell phone minutes a month, and [the company] subsidize[s] a portion of that. And everyone is exceeding minutes."

Would employees feel comfortable e-mailing the CEO, Steve Tran? "Absolutely."

— Leslie Goff

PETER G. W. KEEN

Back to processes

IT'S TIME FOR IT to make business processes central to its work again. Again is a reminder that it was the business-process re-engineering (BPR) movement — whatever its overselling and disappointments in delivery — that brought information technology into the mainstream of business innovation. It anticipated the refocusing of organizational priorities from the company's op-

erations to the customer's needs. BPR brought IT and business closer together than when IT was largely treated as operations support. It gave it organizationwide relevance.

Sadly, the complex demands of enterprise resource planning and Y2k have since moved IT back away from the business; there wasn't any time for meaningful dialogue. Now, it's vital for the business that a new dialogue be built. That dialogue is about e-commerce and its companion, electronic customer relationship management for the online enterprise.

These are priority innovation agenda items with executives who are well aware that the Internet changes the rules of competition. They aren't yet generally aware that business processes increasingly make the difference in e-commerce. (My fellow columnist, Jim Champy, addressed processes in this space two weeks ago.)

That lesson should have been learned from the experience of retailers during the 1998 holiday shopping season, when it became clear that having a great Web site could never compensate for poor links to inventory management, fulfillment and shipping processes. The last holiday shopping season saw more of the same: customer service disasters that put long-term relationships at risk. Businesses were thinking about their Web sites rather than about the process excellence needed to support the sites.

More positively, supply-chain management last year moved from an organizational orphan — a low-level and highly fragmented set of administrative and overhead operations — to a strategic enterprise initiative. Evidence of this is the business-to-business e-commerce explosion and announcements by automakers, airlines and other industries that they're launching cooperative logistics hubs.

Little of this is about Web sites. The goal here is a relationship interface — a point of contact between the company and a wide range of parties in its value network, including the many suppliers, allies, referral partners, intermediaries and other collaborators. It's how a site is en-

hanced by processes that build and sustain all these relationships that helps determine e-commerce success. According to McKinsey & Co., less than 1.5% — or 127,000 — of the 1.8 million hits a major e-commerce site gets per year turn into purchases, and only 24,000 become repeat customers — that is, relationships rather than just one-time transactions.

BPR emerged in the era of client/server computing. Now, the e-commerce tool kit opens up myriad opportunities to source business processes. The most obvious way is to embed business rules in software. That's what many business-to-business innovations provide. Dell's Premier Pages and Ariba's software put an entire procurement department's rules into the relation-

ship interface. Companies can also out-task functions to best-practice online players; it's in this sense that we speak of a firm building a value network. Logistics companies like UPS now handle not just shipping of goods but also the assembly of orders, warehousing and even payments.

Need a top-rate research department for your securities company? Want to extend its brand by adding financial advisory services, banking or insurance? You can in-source these processes the way Schwab and Fidelity do. Whatever processes you want for handling routine operations can be obtained through electronic linkages via embedding business rules in software, out-tasking and in-sourcing. You can then concentrate your firm's efforts on being exceptional in handling the nonroutine — the customer crises or service breakdowns.

This is all e-process — process design for the era of customer relationships and logistics, which serve

as the urgent and critical drivers of today's business decisions for being in business tomorrow. Isn't this what IT should be about? ▀

It's vital for
the business
that a new
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be built.



Keen's new book, *The eProcess Edge*, co-authored with Mark McDonald, will be published next month by McGraw-Hill and Computerworld. His e-mail address is peter@peterkeen.com.

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Open to Attack

Hackers aren't your biggest threat. Strategic tools are making companies data sieves in the real world, while online B-to-B strategies drive others into the arms of partners whose motives – and existence – are uncertain. By Kevin Fogarty and Sarwar Kashmeri

BUSINESSES ARE racing into e-commerce, mobile computing and global expansion, all relying on technology to get them there. But that technology can also trip them up.

A panel of experts talked to *Computerworld* business editor Kevin Fogarty and eBizChronicle.com Inc. CEO Sarwar Kashmeri about what the risks are and how global organizations need to cooperate to keep the bad guys in line.

KEVIN FOGARTY: Let's start with the coincidence that, the morning we sit down to talk about this, Mafiaboy, a 15-year-old kid, was arrested in Canada for launching denial-of-service attacks against Yahoo and others. Is this kind of thing a serious concern, or just an annoyance?

PAUL S. RAINES: I'll take a stab at it. A lot of people want to think that because a teen-ager launched the attack, that it must be really sophisticated. The real tack they should take on this is that because a teen-ager launched the attack, it's not that complicated to understand.

If you look at the distributed denial-of-service attack, everyone else had to pay a price because others weren't maintaining good security on their sites. So one of the things that I think will happen is some regulation of that.

Before a site gets a domain name registration, it [should] undergo site penetration testing, a security inspection. Then once it passes it, you could take a public-key certificate and embed it in a digital watermark on that site, so that you could see that that was indeed a safe site.

ALAN E. BRILL: The thing that I see in this whole Mafiaboy business is, I would bet, for all intents and purposes, [that he's] absolutely judgment-proof. If you're a victim, you're going to look at this and you're going to say, "Well, Mafiaboy is not a real great person to sue because, even if I win, I won't get anything."

But the attack didn't really come directly from Mafiaboy, did it? It came from a whole bunch of other places, some of which — universities — may not have a lot of money, but some corporations, some banks, they do. I think the way the issue may start to be brought to everybody's attention is when people start to say, "You who didn't notice that this was placed on your site, were you negligent?"

Once that starts to happen, people are going to be positively motivated to take some of the steps that they ought to. Often what legislation is not ready to do, litigation is there to start.

THOMAS W. PATTERSON: I think that there's a third option: capitalism. If a company's not doing well, if a store doesn't have traffic or they've got break-ins all the time, shoppers stop going there, so [the store] hires a security guard. They put up bars on their windows.

I think if they want to stay in business, they need to learn how to stay in business on the Internet.

BRILL: But if you look at the life cycle of dot-com organizations, over and over, it's the same old things that are happening, not just high-tech incidents but low-tech incidents hitting high-tech



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▲ **ALAN E. BRILL** (cyberhelp@kroll-ogara.com) is global practice manager for high-tech investigations at Kroll Associates. He has authored five books and once worked as a U.S. Army major assigned to the Secretary of Defense

PHOTOS BY ANDRE SOUROUJON

companies. We had one company in Silicon Valley call us in on a Monday morning. Their people came in, couldn't log on to the server, and they finally figured out why. Over the weekend, somebody had come in and stolen the server, so there was now a space with wires. No burglar alarms, no real security; it hadn't occurred to them.

A good way to start making this happen would be if the VCs said, "As part of the deal, I want you to have a security review; I want you to do the right thing, not just in terms of firewalls and intrusion detection, but physical security, background checks on your people, the right kind of non-compete, the right kind of confidentiality agreements."

SARWAR KASHMERI: Would you say that on the business-to-business side, the security is tighter?

PATTERSON: As you look at these big companies doing dot-com things, the old guard is intimidated by the new guard. And if the new guard says, "We don't have time for that; we don't have to play by those rules. I know we've got a 'what-we-can-post-on-the-Web' policy, but the hell with that, we're going to go just set up our own server in my garage, and do our own policing of the stuff." The old guard lets that happen because they don't really understand what it takes to perform and succeed on the Internet.

BRILL: What we're seeing is, on the Internet, nobody knows you're a fraud.

We got a call just last week from an organization that asked us, "As we establish B-to-B linkups, how can we find out if an organization, somewhere on the far side of the Pacific Rim, is real?"

The concept of due diligence has been suffering because of Internet time. If you want to do this transaction, you have to do this transaction right now, and all you know about them is what they claim, and that they have an IP address that you can actually contact. That's one of the places where you have to stop thinking purely in real time for the sake of real time, and again, start applying traditional business acumen to the problem.

Fast Access, High Risk

BRILL: The other area that we've seen recently

[that is] becoming more and more dangerous, in the IT area, is that executives in many companies are getting faster and faster connections at home — DSL, cable. And those are obviously inherently more dangerous. They're on all the time, they have fixed IP addresses.

If they have these connections, I would make sure that I had them install some sort of firewall-y type program. I recently was talking to a UN ambassador who was telling me that he just got his cable modem in. I asked him if he had this, and he said he didn't. We had lunch about a week later, and he said that within an hour of installing it, he was getting hits. Why would people

do that? Maybe because you believe that these execs will take work home, and it's a lot easier to steal it from their home computer than it might be from their company computer.

RAINES: We use two-factor authentication when [executives] are on the road. So it's that type of strong authentication mechanism and encryption that we look at and try to enable them that way. **PATTERSON:** But there are fairly secure ways to link into your office network. You can set up a [virtual private network] port. It's much more secure; it's not impervious to all threats, but it's much more secure than having a bank of modems there and not publishing the phone numbers and hoping that nobody figures it out. You don't see too many companies really performing good risk analyses, though. They just assume that the threat they read about in *Computerworld* must apply to them, therefore they'd better do the countermeasure that's suggested at the end of the article. That's wasteful; that's dilutive.

Know Your Staff

RAINES: One issue I wanted to raise was the risk of internal employees. What I find ironic [at] some of the dot-com companies, the turnover of their employees. They'll have people who are there for less than a year, and then they get recruited off to go someplace else.

BRILL: That's exactly what we find. In fact, we have had occasion to look at the various logs on some knowledge

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Internet technology seems to evolve at the speed of light, but law evolves at the speed of Congress.

ALAN BRILL,
KROLL ASSOCIATES

COMPUTERWORLD • EBIZCHRONICLE
**WEB SECURITY
ROUNDTABLE**

Open to Attack

Continued from page 53

engines, and, what a coincidence: In the week before each of certain people left, they suddenly had a desire for knowledge in volume. Nobody really had made the decision that said, "If somebody suddenly starts accessing 20 times more stuff than they've ever accessed before and that has nothing to do with their project, that's a warning sign."

Enforcement

KASHMERI: Could each of you comment whether you think the laws we have on the books now are sufficient?

RAINES: I think the laws themselves are sufficient. Where I think there may be some shortcomings is in issuing warrants, especially across jurisdictions — that is, not only between states but between countries.

PATTERSON: I very strongly believe that, when it comes to electronic commerce, the laws have to follow, not lead. I want commerce to lead, I want capitalism to lead. I don't mind if some companies that don't do a good job at running an Internet business fail. Over time, it will become obvious what should be a new law and what shouldn't be. I don't think that we're to that point — yet.

BRILL: Internet technology seems to evolve at the speed of light, but law evolves at the speed of Congress. For that reason, I think we need to, as an industry, make our voices heard as to the kinds of laws and regulations that we need to do the job. And to work with some of the international groups that have been formed to allow transnational investigations, transnational search warrants.

Loose Cannons

FOGARTY: What about wireless security and handhelds — threat or menace?

PATTERSON: Privacy is a big issue with mobile users. My Palm VII reports diligently back to [Palm Inc.] exactly where I go. My cell phone reports back to my cell phone carrier, when I'm in my hometown, anyway, within a hundred feet of where I am. And that's mandated by law.

That information is now also available to advertisers. My family might not know where I'm traveling to in any business day, but Palm certainly does.

FOGARTY: What about securing the information on it?

PATTERSON: The rest of the world uses smart cards, and America will someday get there, but we've failed as a nation to get there because it's been technology looking for an application.

BRILL: Right now, there are a couple of

companies that are producing pointing devices, mice, mice, that have fingerprint readers in them built into the panels. Not a separate device. And with the right software, when you hold that mouse and you put your finger on the little red window, it knows it's you. Kind of nice.

KASHMERI: Are the Europeans doing a better job of preserving privacy through their laws?

BRILL: Well, I think they've got a much more organized approach to it. They've got an infrastructure, and that infrastructure, through the European community, has largely been regularized so that the rules throughout the community are rather standard.

PATTERSON: It's actually a very good way to do it. They pass laws; if you want to do business with them, you must adhere to these security practices. America is currently operating under an exemption from those laws. But ultimately, if you want to trade in their community online, you need to play by these rules.

One of the most technologically advanced countries in the world for e-commerce is Singapore. Everybody has smart cards; everybody has a digital certificate. If you want to do business, you must present your certificate and it must be authenticated by one of the trusted authorities that is trusted by the government of Singapore. Why has that happened in Singapore rather than in France?

One of the reasons is that Singapore was small enough to be a good, self-contained test case. Another is they have very strong laws and very strong feelings about what rules need to be enforced in the course of public conduct. A taxi cab in Singapore — the taxi driver pops in his smart card and activates it. That is tracked; everybody knows it. That's just the way it's done.



▲ MODERATORS Kevin Fogarty, business editor at *Computerworld* (top), and Sarwar Kashmeri, CEO of *eBizChronicle.com Inc.*



▲ TOM PATTERSON: "If a store doesn't have traffic or they've got break-ins all the time, shoppers stop going there. I think if they want to stay in business, they need to learn how to stay in business on the Internet"

It's very efficient.

Is that what the bulk of the countries around the world are looking to do? I don't think so. You have to look at what's important to a society and make sure the technology flows that way.

PATTERSON: There has to be the understanding that everybody's country's laws are going to be a little different. You need to be able to look at their site and say, "These are the security practices that they follow. Do I choose to give them my credit card? Do I choose to send them a million dollars worth of goods in the expectation that they're going to mail me a check?"

The G77 [Trade Information Network, an association dedicated to building trade among developing nations] has a program now to help the group of countries that are not the typical big powerhouses to let them participate in trade. It's very hard for the average business or customer to determine if a company that is in Uganda, if they're real, if their quality is good, if they don't use slave labor, if they don't hurt the environment. So the G77 is stepping in to say, "OK, we've looked at them. We've issued them a certificate that says they do these things and as of this time." Then I can make a more informed decision.

KASHMERI: I know of at least one company that's put off their plans to expand to Europe because they're not certain whether their payroll information will be locked out because of the European privacy laws. Are you saying that as each country develops their own laws, that is the price that business may have to pay?

PATTERSON: The companies need to understand what the rules are, make their own judgments and come up with ways to deal with it.

There's a whole new burgeoning business of certificate authorities. These are people that sort of hold the

keys to transactions, setting up in off-shore, small-island nations that don't have good conductivity and are subject to tidal waves and hurricanes. But they have a rule of law that says that the Justice Department, Janet Reno, can't come in and get the keys. So you keep your data in the U.S.; you keep your data in France. But the keys to that data to be unlocked are going to be off-shore. It's a whole little cottage industry growing up for people trying to skirt those exact laws.

Other Threats

RAINES: If you want to look at potential threats to the banking industry, that is one that I'm concerned about, is someone setting up a server in their basement and calling themselves — let's say Citybank spelled with a y, C-i-t-y instead of C-i-t-i bank. And someone was duped into giving them account information, maybe credit-card information, and money. And then they just shut off the server, and then they make off with it. So one of the efforts that I applaud is an effort to certify banks — that they are who they say they are.

BRILL: But even legitimate people do silly things sometimes. There was a case recently of an actual bank that decided, as part of its e-commerce strategy, to allow you to initiate transfers from other accounts online. So if you gave the account number and the routing information, they would transfer the money, whether it was your account or not. It didn't occur to them that you might get somebody in there who had access to people's bank accounts numbers and would put in other people's accounts to transfer the money. ■

This roundtable was a joint effort by *Computerworld* and *eBizChronicle*, an online daily news service on e-commerce (www.ebizchronicle.com).



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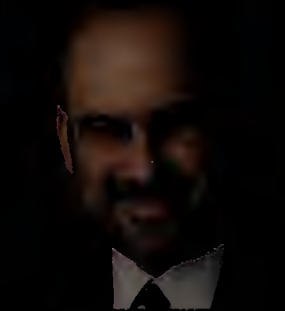
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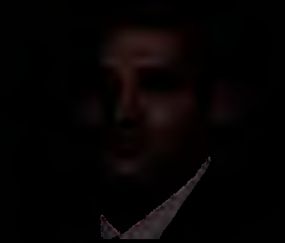
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PREMIER 100 IT LEADERS



EDITOR'S NOTE

This newspaper is wholeheartedly devoted to the IT leader – it says so right on the cover. But what exactly is an IT leader? Or, to put it more crudely: What makes these people so special, anyway?

Our editorial staff set out on a groundbreaking, ambitious project to define who these people are, what makes them tick and what we all can learn from them.

First, the editorial research unit, led by Lorraine Cosgrove Ware, developed the *Computerworld* IT Leader Index, a set of characteristics that describes business and technology people who guide the effective use of information technology in their organizations. In short, they foster ideas and creative work environments. They have a vision for innovative solutions to business challenges. And they effectively manage and execute IT strategies.

We obtained 210 nominations and had the nominees fill out an extensive, probing survey to see how they matched up with the characteristics in the leadership index. The result: 100 IT leaders – the ones whose characteristics most closely mapped with the index – were selected as the Premier 100. They're listed (in alphabetical order, by industry) in the charts near the end of this report.

But this special report is more than a list of the best of the best. Through the survey results and chats with our writers, we learned about the leaders' career paths, how they nurture their staffs, what they look for in new employees and how they select technologies. And don't miss our back page, which explores their struggles with balancing their work and home lives.

The result is that we know more about IT leaders than ever before.

Mitch Betts

Mitch Betts
Editor

MOREONLINE For more resources for the IT leader, including forums, book excerpts, links to stories on leadership topics and fun trivia, visit www.computerworld.com/premier100.

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COVER TYPOGRAPHY BY ALAN KIKUCHI

COVER STORY



“An IT leader is the one who sees the possibilities. They’re the strategists.”

CHARLIE FELD, e-business leader,
Delta Air Lines Inc.



“You’re dealing with issues that can dramatically change a company.”

JERRY MILLER, CIO,
Sears, Roebuck and Co.



“[IT leaders] make decisions that impact the bottom line.”

PATRICK THOMPSON, CIO
Turner Industries Ltd.

PHOTOGRAPHY LEFT TO RIGHT DOUG HOPFER • OAVO JOEL • MICHAEL TERRANOVA

CIOs MORPH INTO BUSINESS STRATEGISTS

They've emerged from the back office, implemented ERP and are leading the charge to e-commerce. By Julia King

ASK A DOZEN INFORMATION TECHNOLOGY EXECUTIVES TO DEFINE IT leadership, and three common themes emerge pretty quickly — vision, risk-taking and change. • Most describe a person who sees not only into next year, but also into the next decade, when many companies will be unrecognizable from what they are today. • “An IT leader is the one who sees the possibilities. They’re the strategists,” says Charlie Feld, formerly CIO and now electronic-business leader at Delta Air Lines Inc. in Atlanta. • Delta, for example, remains first and foremost a transportation company. But thanks to Feld and others, it has also developed technology-based products and services — such as the ability to notify passengers of flight changes via wireless pagers and to auction airline seats on the Internet.

Five years ago, these offerings were unheard of. Today, they’re a key part of Delta’s overall shift to conducting the bulk of its business electronically.

“That’s one of the issues that makes a CIO’s role so exciting — you’re dealing with issues that can dramatically change a company,” which inherently carries a high risk quotient, says Jerry Miller, CIO at Sears, Roebuck and Co. in Hoffman Estates, Ill.

Last year, the challenge for Miller was spearheading the effort to move the giant retailer’s business to the Internet. That move, in turn, “is changing our business plan and how we leverage land-based stores with Web stores, all of which is a dramatic transformation of retail. And it’s all being driven by technology,” he says.

But the risks associated with such changes are very high. What distinguishes an IT leader, Miller says, is the ability to take the right chances.

“The decisions we make, such as which technology platforms to use, are going to have a long-lasting impact on the company,” Miller says. At the same time, speed is critical on the Internet, where yesterday’s no-names, like Amazon.com Inc., are today’s retail darlings.

That’s why Miller has taken the ultrarisky move of turbocharging all IT projects, which now must be completed in less than six months. If it’s a Web-based project, the deadline is in three months.

IT leaders agree that inventing new ways to do business and taking the risks to execute those changes require knowing every corner of the company’s business.

“You can’t just turn to the head of a department and say, ‘How do you want it?’ You have to anticipate and invent technology-enabled changes,” says former PG&E Corp. CIO John Keast. Keast left PG&E for the CIO post at Branders.com, a San Mateo, Calif., start-up that sells customized promotional merchandise online. He most recently moved to Houston-based NetworkOil Inc., a global Internet marketplace for petroleum services and equipment, as CIO and chief technology officer.

“I’ve had more discussions around our

Continued on P4



“Now that ERP is, in most cases, behind us, you’re seeing the pendulum swing for IT leaders to use that data to help business make decisions that impact the bottom line.”

PATRICK THOMPSON
Turner Industries Ltd.

CIO Leadership Equals E-Commerce Leadership

Former Delta Air Lines CIO Charlie Feld is now the airline’s electronic-business leader.

He’s still responsible for information technology, but he also heads a new group for e-commerce joint ventures.

At GM, Ralph Szygenda says his primary job as CIO is “to help transform every automotive executive into an e-business executive.”

Make no mistake, CIOs say: Now and for the foreseeable future, IT leadership means leading companies into the brave new world of online business. Yes, that means buying and selling cars, plane tickets and other products and services on the Internet. But that’s only the start.

It also means leveraging the Internet to help businesses operate at least twice as fast as before and in ways that were unimaginable one or two years ago.

It means being the first to market with innovations, CIOs say.

A case in point is Turner Industries, which is giving customers Internet access to real-time manufacturing information at its pipe fabrication facility.

“Customers don’t have to call managers to get the status of their orders. They can see it for themselves. We know they have that information, so we can’t hide behind anything anymore,” says CIO Patrick Thompson.

The change has boosted the market share of Turner’s fabrication business, which has grown from a \$20 million to a \$120 million operation in the past several years.

Thompson says there’s one big reason: “Our clients tell us no one else is doing this.”

— Julia King

Continued from P3 marketing program and sales program and how we’re going to deal with fulfillment than I have with the technology behind the scenes,” Keast says. But it wasn’t always this way.

“IT used to be a back-room operation,” says General Motors Corp. CIO Ralph Szygenda. “Ten years ago, CIOs were known for their technology prowess and sitting in back rooms making corporations run.”

Then came business process re-engineering, and IT leaders became more heavily involved in a company’s operations and how to streamline them. At many companies, this involved implementing huge and costly enterprise resource planning (ERP) systems, which threw CIOs into the role of megaproject managers.

Now, Szygenda says, IT leaders have been catapulted forward once more — this time into the role of business strategist, which means “actually determining new approaches to delivering products and services to customers.” GM’s decision to sell cars online is a prime example.

EQUAL PARTNERS, FINALLY

Shahla Butler, director of American Management Systems Inc.’s Center for Innovation in Fairfax, Va., says the change is most evident in the way IT is viewed by today’s senior business managers.

“In the last five years, we [have] heard a lot about IT as a service organization that needed to align itself with the business,” Butler says.

Now, that’s all changed, she says. “IT is seen as an equal partner. There’s been a shift from IT being asked to get aligned with business to businesspeople asking themselves how much more they need to understand about technology,” she notes.

Also, companies are adding more IT leadership positions to their executive rosters. “Originally, we just had a CIO whose primary job was to make sure the trains ran on time,” Butler says. Now, “more companies also are looking to have chief technology officers and even chief e-commerce officers,” she says.

Completing those massive ERP projects is what bolstered the credibility of CIOs and paved the way to their new roles as business strategists, says Tim Byers, CIO at Houston-based Shell Energy Services Co., which sells gas and electricity service to residential customers in deregulated markets.

IT leadership has evolved from “delivering a lot of mundane things on time and within budget, which earns IT the right to innovate,” Byers says. “With large ERP and customer relationship management projects, management is starting to see IT deliver. These kinds of projects were the first time business leaders could see IT really transform their business.”

As a result, “IT leaders are being viewed on par with the VP of marketing or VP of finance or engi-

neering,” Byers says. Previously, “IT just wasn’t part of the energy leadership circle,” he says.

Patrick Thompson, CIO at Turner Industries Ltd. in Baton Rouge, La., describes ERP projects as one of the key stepping-stones to IT leaders’ current role as “business intelligence officers.”

“Five years ago, when ERP became the big buzzword, IT leaders were focused on laying the foundation to process data to run the business — to get invoices out and cash in the door,” he says.

“Now that ERP is, in most cases, behind us, you’re seeing the pendulum swing for IT leaders to use that data to help business make decisions that impact the bottom line,” Thompson says.

Yet most CIOs say IT leadership still differs substantially from leadership roles in other parts of an organization. For starters, CIOs are managing highly specialized workers who are in huge demand. This requires CIOs to take a far more active role in recruiting and retaining staff than, say, a chief financial officer might take.

At Sears, for example, Miller says he spends a good deal of his time on human resources issues. He has also hired an IT human resources specialist.

“Leadership in IT differs primarily because of the idiosyncracies of the organization in terms of the makeup of the people,” he says. “I spend a lot of my time on work/life balance, recruitment, retention and training issues.”

Another key differentiator is the all-encompassing nature of IT. It pervades virtually every nook and cranny of companies, such that “there’s not a single aspect of the business that IT leaders can afford not to take an interest in,” says Keast.

This bird’s-eye view of an organization often puts IT leaders in the unique position “to see things that maybe others can’t see because they might be too close to it,” Byers says.

In one case at Shell, for example, the IT group was able to come up with a new and easier way to assemble and graphically display the data the finance department needed to analyze to prepare its reports.

“The finance organization was charged with delivering reports, but IT was able to step in and say, ‘We have a better tool.’ We could take away some of the grunt work that the finance people were doing,” Byers says.

Szygenda says today’s IT leaders have never been better positioned to rise even higher in the ranks in corporate America.

As business strategists, their role is critical to increasing companies’ bottom lines and shareholder value as their companies remake themselves to compete in the ever-growing Internet economy.

“Five years from now, if a company isn’t a totally transformed e-business, then [it] will have significant problems,” Szygenda predicts. •

BY THE NUMBERS
75%
of IT leaders say their management style is “hands-off” and they delegate tasks

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LEADERSHIP MOMENTS

Premier honorees describe their greatest challenges

Irene Dec

Fixing 154 billion lines of code

By Linda Rosencrance

IT WAS OCTOBER 1995, AND IRENE DEC, then vice president of information systems at Prudential Insurance Company of America, was handed one of the most challenging projects of her 18-year career at the firm: Get all systems year 2000-compliant so that Jan. 1, 2000, would be a nonevent for the company's customers.

All systems. Everything. In every department in more than 1,400 locations and in every electronic relationship with 2,000 business partners throughout the world.

The laundry list of what had to become Y2k-compliant was huge: 1,649 applications (or 154 billion lines of code), 1,847 data feeds, 21 mainframes, 4,095 servers, 74,854 desktop PCs, 75 vendor software products and 202 models of voice and data communications equipment. The cost would be \$230 million.

Dec, now vice president of international investments at Prudential, was responsible for coordinating all of it. She had to start the planning process from scratch and manage the risks involved in implementing it.

"Culturally, [a companywide project] was not something Prudential had ever done before," she says.

Faced with this challenge, Dec set up a database of Prudential's portfolio of information technology that needed to be made Y2k-compliant. She created a Y2k leadership team of 25 key staffers, each responsible for a different year 2000-related task. It met monthly at first, then weekly as Jan. 1 approached. On rollover weekend, the group held teleconferences every three hours.

And then, settled into Prudential's Y2k command center in Roseland, N.J., at 5 a.m. on Dec. 31, Dec saw the year 2000 dawn in country after country around the globe.

"I had one eye on the TV, watching the world [enter a new century], and another eye on the databases, watching Prudential turn [to the year] 2000," she says. And Prudential's systems worked.

"Irene did an outstanding job," says William Friel, corporate CIO at the insurer. "It was more than I could have hoped for." •

NICK CARBONELL/CHIO

Richard L. Hudson

Putting the brakes on

By Amy Helen Johnson

FOR RICHARD L. HUDSON, putting the brakes on a three-year, multi-million-dollar re-engineering project — the day before it was scheduled to go live — was just part of the job.

"I'm paid to make those decisions," says the CIO at offshore drilling contractor Global Marine Inc., "and I have to make them even if they're difficult or unpleasant."

The project was large and leading-edge. It would shift the whole legacy infrastructure of the Houston-based oil company from mainframes to a Unix-based client/server architecture. But this was 1995, when client/server expertise was scarce.

Unfortunately, the 24 new servers were as unstable as a broken-legged table, and not even the manufacturer seemed able to diagnose the problem. Hudson decided that the team needed at least another six months to work out the kinks.

His decision, however, ran counter to the expectations of major internal users and the senior management team, which was spread over eight countries on five continents. Client/server had been loudly touted as an important technology change for the company's future, with the go-live date widely publicized. Calling even a temporary halt was

bound to raise eyebrows after such a big buildup. Plus, Global Marine could fall into the trap of never-ending delays, waiting until the systems reached unrealistic levels of perfection before making the commitment.

The potential consequences of switching over to systems known to be unreliable were just as daunting but more concrete. Missed payroll. Cash flow problems. Late SEC filings and tax payments. Maintenance delays on the company's 32 offshore oil rigs.

Perhaps worst of all, Hudson recalls, was the threat to the company's reputation.

"When you're in a business like ours," he explains, "you're selling your credibility."

Although the CIO had already decided the right thing to do was delay the switch-over, he was willing to be convinced otherwise. He turned to the people he trusted most: his IT staff of 34 full-time employees.

"I gathered the team because we work as a unit," he says. "I wouldn't have gone against their advice." But they were just as wary of the new systems as Hudson was.

"He put the brakes on, and that was the right decision," says Greg Farris, a former Global Marine employee who was at the pivotal meeting. "It was a relief when it didn't move forward."

Farris is now vice president of information technology at Oceaneering International Inc., a Houston-based manufacturer of deep-sea and outer-space exploration equipment.

Bringing his staff in on such a critical decision is typical of Hudson, Farris says. One of the traits that makes Hudson a good leader, he adds, is his willingness to hire talented



JAMES MCGOON

people and really listen to them. "Dick typically has a very strong support staff that he relies heavily on," Farris says.

In the end, Hudson got the problems fixed in 30 days instead of the 180 that he predicted would be needed. He says he learned a valuable lesson about building a project that relies on new technology. "Talk to as many people who have done it as possible," he advises. "Salespeople will tell you it costs a dollar and takes a day, and that's wrong." •

Johnson is a Computerworld contributing writer in Seattle.

Honorio Padron

Biting the budget bullet

By Gary H. Anthes

IT TOOK GUTS.

Hired by Dallas-based CompUSA Inc. to salvage a floundering \$50 million information technology project, Honorio Padron worked on it for 90 days, then sold his rescue plan to top management.

Trouble was, he came in the very next day and told management he had changed his mind. "I told the executive team, 'What I just sold you we can't implement. The right solution is to throw away the project and do a new one,'" Padron says.

Padron says a mark of IT leadership is having the courage and vision to set aside short-term advantage for long-term gain — something that's especially hard to do in a field that's changing as fast as IT.

The point-of-sale (POS) system being developed in-house was too complicated and badly designed to serve the computer retailer

well over the years, he says. Better to bite a painful budget bullet and buy an off-the-shelf system, he decided.

Remarkably, the executive team accepted Padron's painful assessment with little objection. That's a tribute to Padron's extraordinary ability to win the trust and respect of senior business managers, says Paul Daversa, CEO of Resource Systems Group Inc., an executive recruitment firm in Stamford, Conn.

Says Daversa: "No matter where he's gone, Honorio has always quickly emerged as a key player on the business operating committee. He's one of the foremost thought leaders in the country in terms of marrying business and technology."

Padron was born in Cuba in 1952 and earned a degree in electrical engineering and biomedicine. He says his educational background serves him well to this day.

"You have to think of the enterprise as an organism," Padron explains. "I see myself as the architect of the digital nervous system. The human body has an infrastructure that allows you to play basketball or play baseball or to sleep. We need to put an IT infrastruc-

ture into companies that has that kind of flexibility."

Padron says the new POS system, followed by a \$100 million rollout of an enterprise resource planning (ERP) system and a major network upgrade — all sponsored by Padron — form that infrastructure at CompUSA.

Last year, ERP vendor SAP America Inc. gave Padron its "Best Run Project Award" for the Americas. The project was ahead of schedule and 15% under budget, Padron says.

The key was getting the authority from the CEO to "keep it vanilla" — to reject requests from users for "weird customizations," he says. "Ninety percent of the time, users don't really need those things, and they won't get you a return on investment," Padron says.

The other success factor was finding a strong, disciplined project manager and then giving him the authority to exercise that discipline, Padron adds. •

"I see myself as the architect of the digital nervous system."

HONORIO PADRON
CompUSA Inc.

Debbi Gillotti

Keeping cool in a crisis

By Julekha Dash

IT'S CERTAINLY A RARE EVENT WHEN Starbucks Corp. serves up free java to millions of customers.

But that's what happened April 14, 1998, when the upscale coffee retailer tried to make its customers happy after a computer glitch shut down cash registers at 1,400 Starbucks cafés across North America.

A hardware upgrade knocked out the cash registers anywhere from 20 minutes to several hours, depending on the store, but not the cappuccino machines coffee-lovers depend on.

Behind the scenes, most of the 200-member information technology staff at Seattle-based Starbucks spent a half-day fixing the problem. Starbucks' then-CIO, Debbi Gillotti, says inaccurate data caused the registers to shut down.

The IT team assigned to the company's help desk answered questions from store managers and helped them restore data on their backup files. "It basically involved some file manipulation," recalls Gillotti, who is now senior vice president and general manager of Starbucks X, the



DAVIS FREEMAN

company's e-commerce division.

"If the store registers aren't operating, it's an inconvenience to customers and employees. The store networks are the lifeblood of our company," she says.

Tom McKievor, vice president of MIS at Starbucks, credits Gillotti's ability to keep calm in the face of a crisis. "She got all of the relevant resources focused on [the situation]," he says. Gillotti assembled a war room to work on all facets of the problem.

She broke the problem into three or four major areas and assigned a leader to each team. The groups worked independently, came up with an answer, reconvened and put together an action plan.

Gillotti's response also involved updating five corporate officers and 20 field managers about the groups' progress.

McKievor says Gillotti demonstrated her skill as a leader by focusing on fixing the problem, rather than assigning blame. "It's not a time to find out whose fault it was. Nobody felt like they were under attack," he says.

Gillotti says the No. 1 task for a leader is to develop excellent listening skills. "Don't assume you know the answer until you listen and learn. Make sure people who work for you help educate you," she says, offering leadership advice to new managers.

How do you know when you've arrived? Gillotti says: "The best compliment to you as a leader is how good the people who work for you become. It's a high compliment when people who work for me are sought after for other jobs. It shows I've done a good job." •

Brian Farrey

Putting IT in the driver's seat

By Lorraine Cosgrove Ware

SHORTLY AFTER BRIAN FARREY joined the Web-based job-search company Monster.com as chief technology officer in June 1999, he recognized that despite the hot Web site, technology wasn't really a core competency at the Maynard, Mass.-based unit of TMP Worldwide Inc.

At Monster.com, the sales and marketing departments were in the driver's seat, and they were planning an extensive advertising campaign to launch during the Super Bowl.

The history was daunting: The company's previous Super Bowl ad had generated more traffic in two weeks than the Web site saw all year. Farrey and his staff of 60 were expected to have the technology in place to handle that increased volume of traffic. This required new Web technology and database

changes affecting 20 sites in multiple countries. The big challenge was to change the company's mind-set and turn a fast-growing, marketing-driven Internet company into a process-driven technology company, according to Farrey.

"If Monster.com wants to continue to innovate and meet customer demands, then technology needs to drive the car," he says.

So he brought some order to the chaos by setting up a process to determine what decisions had to be made and who in the IT and business units would handle particular tasks.

"Brian trusts and empowers his people," says Kathy Murphy, Monster.com's vice president of program management. "He focuses on what we can change."

The results? Monster.com completed its rollout in time for the kickoff. And the Web site was able to handle a surge in traffic during the two weeks after the Super Bowl — when the number of job searches at the site doubled from 2.5 million to 5 million per day.

"More importantly, the company now recognizes the need for process," Farrey says, "and the importance of technology to brand insurance." •

John Puckett

Coaching a stressed-out staff

By Linda Rosencrance

CHRISTMAS 1999 WAS COMING, AND CIO JOHN Puckett had a mere 16 weeks to build a more robust, second-generation e-commerce infrastructure for Toysmart.com Inc. in Waltham, Mass.

It had to offer the best customer experience on the Web, with order placement, fulfillment, shipment, billing, networks and customer care. And it had to securely handle a 20-fold increase in business over 1998.

"As 99% of the retail business is conducted in the last 70 days of the year, it was critical for the entire electronic infrastructure to be ready for the holiday season tsunami," he says.

With limited resources, the pressure on the information technology staff was immense; late nights and double shifts were the norm, Puckett says. But there were no resources to hire additional staff.

Puckett's solution was to have a clear plan, laser-sharp focus — and turn it over to his staff. The result was that the IT staff itself came up with major breakthroughs in design, process and methodology.

"I resisted directing activities and focused on being a coach in this time of pressure," he says. "In the weeks that followed, I continued to motivate our team."

How? Puckett says he motivated by "looking for ways to make new ideas work, taking pride in our victories, maintaining that positive

attitude when the going got tough, supporting decisions made — right or wrong — [and] recognizing team and individual efforts."

John Burke, Toysmart's director of network services and operations, says he was struck by Puckett's ability to create a team and act as its coach. "As a start-up, resources were tight," Burke says. "And we were burning the candle at both ends."

Puckett says the team's progress was "nothing short of a miracle," but there was still one stumbling block: The site load was greater than expected, and Toysmart.com needed more capacity at once.

Given this predicament, the IT staff suggested using a new, untested Web-based product from ArrowPoint Communications Inc. in Acton, Mass.

"To cut a long story short, the product was installed on time, it effectively doubled our capacity, eliminated some latency problems, and gave us instantaneous site configuration flexibility and incredible agility," Puckett says.

"This was a situation where we had our back to the wall," he adds. But teamwork, leadership and some calculated risks helped Toysmart.com earn a No. 1 rating among online toysellers for the holiday season, Puckett says proudly. •

"I resisted directing activities and focused on being a coach."

JOHN PUCKETT
Toysmart.com

Ketty Y. Brown

Sending an unwelcome message

By Sami Lais

IN THE FALL OF 1996, KETTY Y. BROWN HAD A twofold problem: As a new Y2k coordinator at pharmaceutical giant Eli Lilly & Co., it was her job to ensure that systems at its laboratories in Clinton, Ind., were ready for the new millennium.

But the human element of the problem — persuading department heads that the solution wasn't to simply turn off their PCs at midnight — proved knot-tier than fixing code.

Brown, director of business information systems at the pharmaceutical manufacturing site, says she was tapped for the Y2k job simply because her department handles all the business applications at the company. In this case, her challenge was "to make sure [each department] was ready for Y2k," she says, including dozens of systems in accounting, human resources and manufacturing for the 1,000-employee lab.

Brown set a brisk pace for the project, but one department head's briskness is another's brusqueness. "At the beginning, I sent around an e-mail that may have come across as too . . . ah . . . directive," she recalls.

Andrew Bullock, director of process automation at Eli Lilly's Clinton laboratories, says with a laugh, "I was one of the department heads who got that e-mail. It said something like, 'This job has to be done, and you guys have to participate.'"

"I quickly realized I had to back off," says Brown, laughing ruefully.

"Fortunately, Ketty is sensitive to how people respond and how her message is being received," Bullock says. "She enables people to see beyond the madness to the reasoning behind why we have to do things. She gets buy-in."

"I had to go one-on-one with them and understand their business, and I had to make them understand what they had to do and why," Brown says. "They had to know I wasn't there to criticize them."

With the Dec. 31, 1999, deadline looming, ceding any control to others was an act of faith. "I set out clear guidelines and let them decide within those guidelines what needed doing," she says.

In retrospect, that offering of flexibility was the turning point, Brown says. "It changed their attitude."

The Y2k project was a success for mission-critical systems. "We had a few dates that came up funny" in noncritical applications, Bullock says, "but we had planned for that and were able to figure ways around it."

Brown's approach helped make it happen. "Ketty's a good enabler," Bullock says. "That sums up her style." •



MARC BERLOW

"I had to make them understand what they had to do and why."

KETTY Y. BROWN
Eli Lilly & Co.



ALAN JAKUBIK

Jim Prevo

Like performing a 'brain transplant'

By Steve Alexander

TO INSTALL AN ENTERPRISE RESOURCE planning system (ERP) at Green Mountain Coffee Inc., Jim Prevo had to take his team — and his company — on a risky, three-year journey.

"An ERP implementation is like the corporate equivalent of a brain transplant," says Prevo, CIO at the wholesaler and retailer of specialty coffees. "We pulled the plug on every company application and moved to PeopleSoft [software]. The risk was certainly disruption of business, because if you do not do ERP properly, you can kill your company, guaranteed."

But it had to be done. Green Mountain had operated on homegrown applications that had "run out of gas" as the company grew revenue 30% annually since 1993. By 1996, the firm was unable to manage its inventories electronically. That meant keeping extra-high inventories to ensure orders could be filled — and even then, they sometimes weren't.

"What was at stake was our long-term ability to grow," Prevo says.

But ERP wasn't the project that management

had asked Prevo's department to undertake. The initial plan was for a five- to 12-month in-house revamping of the company's software. Believing that wasn't enough to solve Green Mountain's problems, Prevo had to sell management on a three-year ERP project instead.

He managed to do so even though he had to explain that installing an ERP system was a bet-the-company strategy: If it didn't work, the company could be out of business.

"A CIO or IT leader must make the judgment of when the risk is low enough to make the jump," Prevo says.

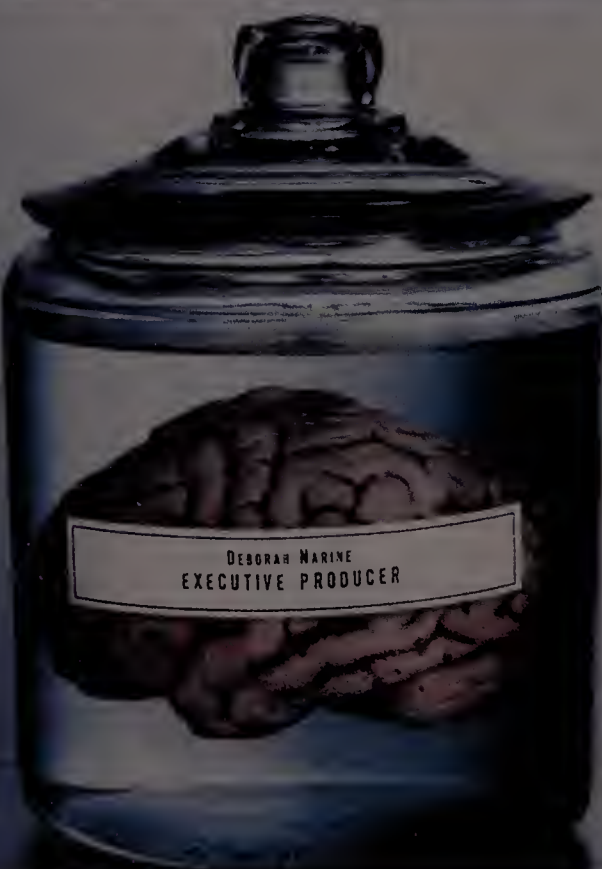
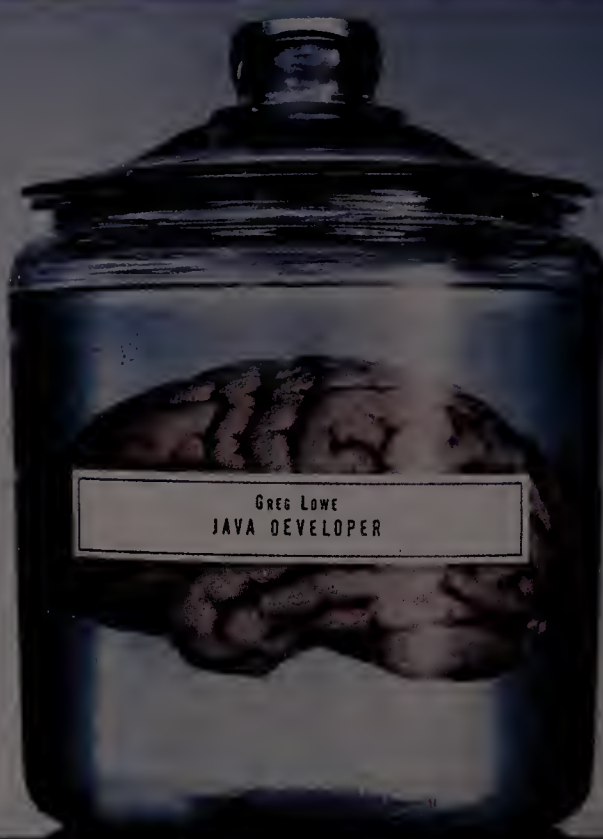
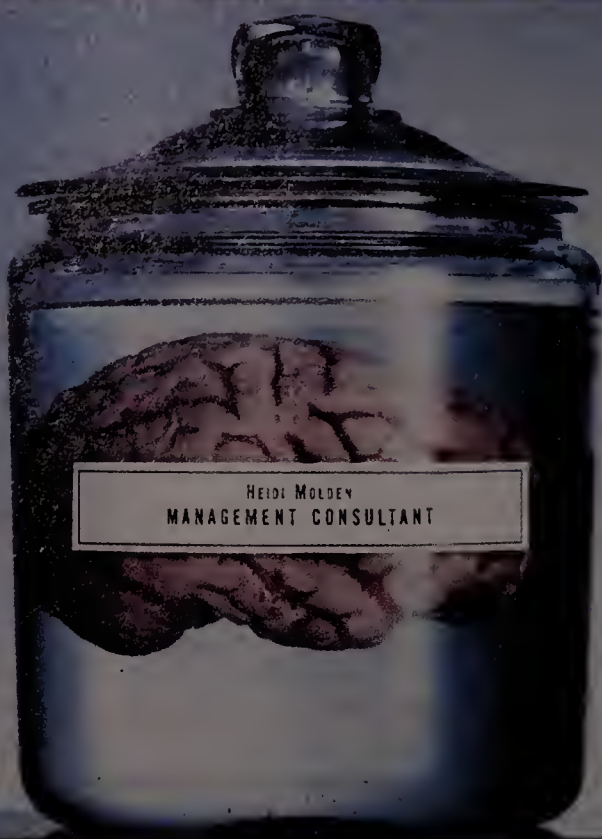
To make the project work, Prevo had to be a leader without being the overall boss of everyone on the cross-functional team. Luckily, he had the background. "I used to be a software engineer at Digital Equipment . . . so I had a great deal of experience managing teams where I had influence but not authority," Prevo says.

Once the PeopleSoft project had begun, Prevo found himself trying to keep the implementation team's spirits up, despite some of the glitches that come with an ERP installation. For Green Mountain, that included online sales functions that didn't work properly and servers that were swamped by the new workloads.

"Jim was in a leadership role in this project, and he added a tremendous degree of insight and support," says Robert Stiller, CEO of Green Mountain Coffee in Waterbury, Vt. •

Alexander is a freelance writer in Edina, Minn.

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If we had a showroom, it would look sort of like this.

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Boris R. Bosch

Passing along
'tribal knowledge'

By Amy Helen Johnson

WHEN BORIS R. BOSCH WANTED to make a fundamental change in the culture of the database administration department he runs at New Orleans-based Entergy Services Inc., he appealed to both his staff's pride and self-interest.

He offered them a chance to outshine their co-workers, while developing new skills and earning interesting new assignments. He also got their attention by adding a new evaluation item to the annual employee review.

His problem was persuading a group of individualistic thoroughbreds — the highly skilled, highly sought, senior-level database administrators (DBA) who run the mission-critical operational stores for the electrical power-plant builder and operator — to harness themselves to the junior staff and pass along some of what Bosch calls "tribal

knowledge." For example, Bosch says when he was a staff member himself in the early 1990s, implementing the first data warehousing project for the company, there was so little tribal knowledge about the technology that the team set an especially ambitious deadline.

"I guess we were so stupid that we didn't know it couldn't be done in four months," he says.

But getting his senior staff to coach the less-experienced staff members was difficult, Bosch says, until he came up with a formal mentoring program. "Mentoring is done all the time," he notes, "but it has not been formalized and turned into something positive."

He organized the program by assigning one mentor to each new person, or sometimes two mentors if the newbie needed coaching on several applications.

Then Bosch made the effectiveness of the mentoring — measuring how quickly the new people came up to speed on their assigned set of applications — part of the mentor's performance review.

Each new employee's first assignment is to document internal processes and any important architectural idiosyncrasies, a task that naturally turns them toward

their mentor for assistance.

Getting staff to buy into the mentoring program was easy. Bosch pointed out how the mentoring program offers personal benefits: Without colleagues who can manage their applications, database administrators would be stuck doing the same task forever and would miss chances to join hot new projects.

That was an effective argument, Bosch says. Now the senior staff competes on how quickly their newcomers come up to speed.

Keith Harris, an information technology consultant on Bosch's staff, says the process of becoming a mentor was aided by Bosch's open, honest management style, which created a positive culture.

Not only do the participants benefit from the mentoring program, but the department and the company do as well. The database administration department enjoys a highly cross-trained staff, documentation of that elusive tribal knowledge and an average training period that's brief and thorough.

Entergy ends up with databases and applications that have better architectures, require less maintenance and fail less frequently. Considering the scope of work handled by the database team — 200 database applications — that's a significant plus. •

William S. Wallace

Knowing when to say no

By Lorraine Cosgrove Ware

TOP MANAGEMENT WANTED WingspanBank.com — the Internet-only banking division of Wilmington, Del.-based First USA Bank NA — up and running in 60 to 90 days.

CIO William S. Wallace had the unenviable task of telling his bosses no.

The rollout of WingspanBank.com required integrating technologies from 30 vendors at 16 sites. Wallace and his team of 1,000 believed a deadline closer to 120 days was far more realistic — and they wouldn't let the site launch without thorough stress testing.

So Wallace had to push back.

He met face-to-face with senior management and presented a concrete plan that spelled out what had to happen in order to have a successful launch.

Selling senior management on his plan required diplomacy and business skills, including knowledge of the banking marketplace, familiarity with the various product-line budgets and expenses and an under-

standing of the ramifications and costs of the delayed launch.

Fortunately, Wallace's business credibility was good with the chairman of the board and the business units. "Bill has a lot of business acumen. He doesn't rely solely on business units to tell him what to build," says Chip Weldon, a senior vice president at WingspanBank.com.

Wallace focuses on business solutions first and then makes sure WingspanBank.com's IT staff is aligned closely with business functions. He relies on goal-based management for his IT staff and ties goals and rewards to the business unit objectives.

About 60 IT employees are dedicated to specific business functions and work closely with the individual business units. Wallace says smaller groups are more effective than larger groups, so he assigns eight- to 10-person teams to work on components of larger projects.

"The power of our organization is in our cross-functional teams, where everyone feels a sense of ownership for what we've

created," Weldon says.

Wallace says he considers himself a "walk-around manager." He spends time at all 16 sites, meeting with members of his staff as often as possible. This contact helps him understand day-to-day issues and get a sense of his team's morale.

As Weldon puts it, "He's in the trenches, with his hands on the wires and plumbing."



"Any IT leader has to be in touch with the units the IT staff serves."

WILLIAM S. WALLACE
WingspanBank.com

WingspanBank.com was launched successfully in 123 days and has soared ever since.

"Any IT leader has to be in touch with the business units the IT staff serves," Wallace says. "You must know and understand all of the 'moving parts' of a project and understand the impact of your actions on the customers, employees and shareholders." •

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One nervous caddy.

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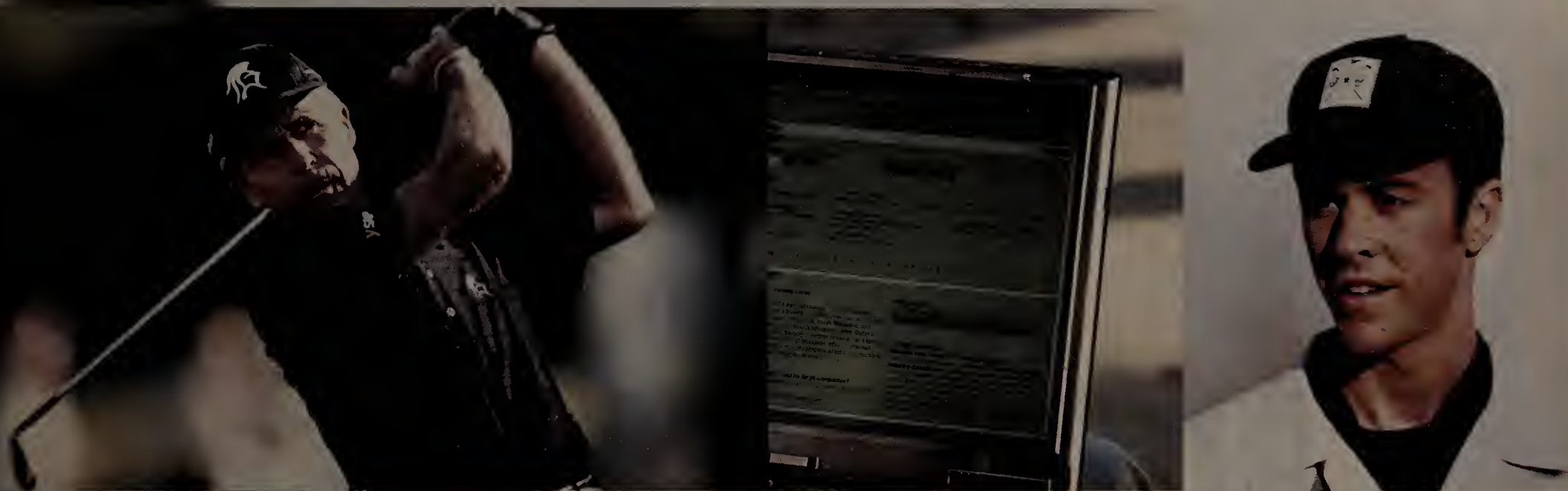
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TAKING RISKS, BUT ONLY SO FAR

Leaders involve top business execs in IT decisions and test products thoroughly.
By Matt Hamblen

WHEN YOU CHAT WITH NEARLY A DOZEN IT LEADERS, IT'S striking to hear them talk about how they're comfortable with a certain amount of risk — and even some failures — when selecting information technology and vendors. • “We’re not afraid of failure here. We try to go out on the edge as far as we can,” says Paul LeFort, CIO at UnitedHealth Group Corp. in Minneapolis. “We take the risk because having a six months’ advantage over a competitor with a new technology is very important. We figure if we’re not failing about 30% of the time in making our technology choices, we’re probably not doing our job.” IT leaders say their organizations learn from such failures. • Likewise, for Rick Nolle, risk isn’t a scary or foreign concept, or even a four-letter word. As vice president of systems at Reinsurance Group of America Inc. in St. Louis, Nolle’s company assesses risk in multimillion-dollar insurance policies every day.

He says he’s willing to take some chances when he hires a vendor or buys big-ticket systems because taking risks leads to innovation.

Of course, risk-taking can go only so far. In corporate America, risk is a factor that needs to be managed. In the IT field, the risks range from dead-end technology choices and belly-up vendors to buggy software and crashing networks.

So how do IT leaders manage those risks?

Picking the right technology and vendor involves painstakingly testing products, reviewing the credentials and backgrounds of vendors, comparing notes with peers and demonstrating a willingness to partner with — or invest in — start-up vendors with hot technologies.

It helps to have an ultraclear technology strategy and a companywide understanding of the goal, Nolle says. “Here, it’s like JFK saying, ‘We’ll get to the moon at the end of the decade,’” he says.

Some IT leaders say the first step is to get the CEO and the board of directors involved in the biggest technology choices, although there is some debate about how much board-level input is ideal. “Companies are well-versed in making checklists and acting as a kind of *Consumer Reports* when picking technology. But they are incredibly bad at what I

Continued on P16



MARK LUNENBERG

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If a small company with an important new technology is “really hot, we might help them go public and underwrite them.”

TSVI GAL
formerly at Merrill Lynch & Co.

Continued from P14 call ‘continuous convergence’ — at picking a technology point on the horizon to be moving toward,” says analyst Howard Rubin at Rubin Systems Inc. in Pound Ridge, N.Y.

He says that kind of goal-setting needs to happen at the very top — even above the CIO level — and include the CEO’s staff and the board of directors. Rubin says he would have boards set up “technology investment subcommittees,” just as companies have had compensation committees for years.

Giving such high-level attention to IT decisions raises the chances that an application will have business benefits such as reduced costs, improved employee retention or an enlarged revenue and customer base, Rubin says.

BOARD-LEVEL ROLES

Tsvi Gal, former chief technology officer at Merrill Lynch & Co. in New York, agrees. “It is becoming clearer that at least one board member should become the champion and overseer of IT,” says Gal, who is now co-founder of and chief technology officer at Global Bandwidth Inc. in New York. He says having the CIO join the executive management committee is “hardly sufficient.”

Nolle says CEO involvement in IT is fine, but he questions how involved boards of directors need to be. “Our IT department is very involved with the [chief operating officer] and the CEO with a lot of our decisions for spending on large purchases, but I can’t imagine anything more,” he says. “That’s why you hire a bright manager to run things.”

Dawn Lepore, vice chairman and CIO at Charles Schwab & Co. in San Francisco, sits on the boards of several firms. “I do not think it is a board’s responsibility to help drive details of the company’s technical strategy,” she says, the key word being “details.” Lepore says she’s on the board “to advise, help and support the company in areas technical and otherwise.”

At UnitedHealth, LeFort values the business side’s involvement in technology decisions. Purchases costing more than \$1 million are reviewed by an executive council of six IT leaders. For IT decisions that involve purchases of more than \$10 million, the company president and an executive council of five business-divisions executives conducts the review.

“Business executive involvement matters so much because 85% of our capital expenditures

are for IT,” LeFort adds. “And most savvy CIO veterans know that three-fourths of the success of a project has nothing to do with technology itself — it’s the business side taking an interest. So you have to make sure the business side is wired to the decision.”

Unfortunately, says Joe Auer, a consultant at International Computer Negotiations Inc. in Winter Park, Fla., there’s a dearth of board-level interest in IT strategies and initiatives at Fortune 1,000 companies. Firms will heavily involve the board of directors in a decision to spend \$10 million for a plant, yet they often give less consideration to a \$10 million IT purchase, says Auer, a *Computerworld* columnist.

The company’s relationship with major vendors should be managed by executives at the CIO level or higher, he says.

“The initiative needs to be multidisciplinary, with legal, operations and technical people on a team doing everything from managing spending and consolidating buying power to keeping vendors from running rampant,” Auer says.

Aside from board-level involvement in big technology choices, the classic IT approach of thoroughly testing products is still a very important step, analysts say. But Auer urges companies to test new products in a controlled laboratory environment first — not in production systems or in end-user hands.

Auer warns against installing products on a “trial” basis, because end users may become dependent on them. Then, if the company says it wants to keep the product, “the customer has lost all negotiating power over cost and other contract terms,”

Auer says. About 75% of trial products end up being used by customers, he notes. So he strongly recommends that companies never install a product on a trial basis, unless contract terms and dollars are already negotiated should the company decide to keep the product.

Of course, IT leaders say they find testing and evaluating products in their work environments — sometimes in labs and sometimes in a user environment — essential.

Gal and others say the principal value in

testing is usually to see if an unknown new product will scale to many thousands, or even millions, of end users. New and unusual products are fair game for testing “because this is a brave new world, and you must try to be ahead of the competition,” Gal says.

Because there is inherent risk in trying unproven products from start-up companies, IT leaders say they and their staffs do an enormous amount of background checking on companies and their previous customers, using every tool at their disposal. They use the same techniques with mainstream vendors.

In picking service providers or new technology and vendors, large firms consult trade publications and online reviews, scour reports from multiple consultants and seek advice from peers as well as customer references. At Merrill Lynch, a small technical group has been set up to do a full comparative review of new products and their vendors.

IT leaders also say they’re open to investing company money in an IT start-up — or even buying the company — if the start-up’s technology could provide them with an edge. The goal is to get special access to hot technologies and workers with advanced skills. “We’re interested in putting the technology to work before others do,” says LeFort. UnitedHealth has \$30 million to invest in IT companies.

Gal says if a small company with an important new technology is “really hot, we might help them go public and underwrite them.”

The choice of which companies to invest in is sometimes more an art than a science. “We meet, and we look in their eyes, and it is partly intuitive,” Gal says. “Yes, I want to know if the CEO was selling shoes in his prior job. But I make decisions based on 25 years of experience and from sitting on boards and helping companies that succeed and others that don’t.” •



CHRIS WEIL

BY THE NUMBERS
86%
of IT leaders agree that “innovation requires an acceptance of the possibility of failure”



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The 'perfect IT hire' is smart, flexible, willing to learn and fits the company culture.

By Deborah Radcliff

FINDING THAT ELUSIVE CHEMISTRY

INFORMATION TECHNOLOGY EXECUTIVES ARE ONLY AS GOOD AS THEIR STAFFS. That's why Gary Cooper, vice president of information systems at Tyson Foods Inc. in Springdale, Ark., says he looks for "smart, adaptable, self-starters" when hiring for his 275-person IT department. • And Manoj Tripathi, CIO at Jamba Juice Co. in San Francisco, says he looks less at skills and more at "underlying traits, indicating a willingness and ability to learn." • IT executives are all looking for that elusive "perfect IT hire." And, as you might imagine, finding that perfect employee isn't easy, especially in today's tight labor market. • So these and other IT executives use a variety of methods to attract and find the right combination of skills and attributes. Some hire from local colleges. Others rely on employee referrals. Others recruit from inside their corporations. Still others hire professional recruiters.

Take Tripathi, for example. With 12 IT workers, the company is bringing Jamba Juice, a popular Bay Area vegetable and fruit-juice outlet, into the 21st century. His staff is developing Web applications, a telecommunications infrastructure, and back-office and supply-chain systems. Typical of most smaller companies, Jamba Juice can't afford to hire people with specific development and networking skills, so Tripathi hires those with some basic knowledge and then trains them.

"This may sound like heresy, but I'm not that concerned about the technical skills," Tripathi explains. "It's more difficult for us to find the skills we need, so we look for a couple of attributes. Can the person work at learning and delivering? We're in a learning mode here all the time."

Such attributes aren't usually spelled out on a résumé, so Tripathi likes to talk with candidates so he can spot the characteristics

firsthand. For example, he recalls a time last year when he was hiring a systems developer. "We had a candidate who didn't have a proven track record for the particular skill sets we were looking for. So we had to make sure the person could grow," says Tripathi. "She had worked with several different programming languages, so that told me she is adaptable to different tools."

Still, he says, finding the right underlying attributes — "a person who's not only smart, [but is also] a little bit wise, willing to learn everything" — is difficult. So in addition to checking experience, Tripathi probes to see if the candidate is more interested in

money (not so good) or a career path (good).

He drills the candidates until he's clear on what they're looking for. "Do they want somewhere to grow and learn retail? Are they just looking for a fun place to work, a small company or what?" he says.

"It's like a marriage," he explains. "If we can't agree on these fundamentals, then it will never work."

While Jamba can't afford to pay for already skilled workers, Net2Phone Inc. can't afford not to pay for highly skilled workers.

David Greenblatt, chief operating officer at Net2Phone, a voice-over-IP service provider in Hackensack, N.J., says that because his company provides high-tech services, he hires only individuals with up-to-date skills for the company's information systems, Web and internal voice-over-IP groups.

Because of the fast-paced nature of the *Continued on P23*

GARY LAUFMAN



JAMBA JUICE CIO
 Manoj Tripathi hires
 people who have some
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Continued from P20 service provider's business, "we do not have the luxury of hiring a less-experienced developer," Greenblatt says. "So we look for a higher caliber of employee. Each of our groups needs the specific skill sets to go with the job. But we're also looking for people who are agile, can assume responsibility and who are clearly alert."

That's because projects often change on a dime. Greenblatt says he needs people who can think "out of the box" — and perhaps come up with a different approach to a project.

TALENT DRAW

Net2Phone has less difficulty attracting experienced developers than smaller firms. Top-notch IT workers enjoy working in a fast-paced, cutting-edge Internet environment — both for skills development and stock incentives.

About 10% to 20% of Net2Phone's new IT hires come from employee referrals, a program Greenblatt says he strongly prefers because the new hires from this source tend to work out the best.

"The people who are valuable in this organization... have an appreciation for the different pieces of our business."

GARY COOPER
Tyson Foods Inc.

That's because employees are likely to recommend someone they'd want to work with, says Chris Borneman, chief technology officer at Commerx Inc., a vertical Web marketplace in Chicago.

In 1998, Commerx was home to only three IT employees. Today, the department is 30 strong, with 15 from employee referrals. "The money for referrals [\$1,000] is good. But the IT staff really likes to refer because they can pick who they're working with," Borneman says.

Like Net2Phone, Commerx must hire experienced IT professionals because of its fast growth. So last year, Borneman hired an on-site recruiter.

"This has helped us tremendously by bringing us a focused approach to recruiting. The internal recruiter manages all of our external recruiters, our pipelines and online recruiting sites. [She] also coordinates things so that the candidate has a positive experience here," Borneman explains.

The internal recruiter takes the burden off Borneman and his staff to set the scene for the candidate: explaining the work environment and corporate philosophy, answering candidate questions and identifying area attractions. She also handles prescreening and interview scheduling.

OF INTERVIEWS AND RESUMES

When a candidate is interviewed, Borneman's staff members all ask questions and compare notes. First, they like to see if candidates understand the business value of their past products. They also try to find out where the candidate wants to grow and gauge what the candidate is looking for in a job.

For example, job candidates might say they want to gain an understanding of a certain business process or technology. "And we say, 'Great. What are you prepared to give?' We like to make them think about this not just as a job, but as a relationship," Borneman explains.

At Tyson Foods, most new candidates are insiders who want to transfer from other units, such as Tyson Chicken or Tyson Frozen Foods, to train in technology jobs.

Cooper says he prefers to hire from the inside, mostly because when he hires IT people from outside his rural area of Arkansas, they often get restless and return to big cities. He says the only way to retain his new hires is to hire from inside and offer long-term career paths.

"The people who are valuable in this organization are the ones who bounced around and have an appreciation for the different pieces of our business," Cooper says. Tyson also

recruits from the University of Arkansas and offers 22-year-old college students five to seven years of hands-on technology training, he says.

Like Tripathi, Cooper says he's looking for smart people, not necessarily those with highly specialized skills. For example, he says he'd just as soon hire a person with a background in C programming and train him in PowerBuilder, as long as the candidate demonstrates the ability to learn.

Because he's looking for core values — business savvy, ability to embrace change and eagerness to grow — Cooper's hiring team often rules out candidates based on their résumés alone.

"We had one candidate [whose résumé had] no less than four different fonts on one page. It was ugly. He hadn't thought about how to present himself," Cooper says.

But when his hiring-team members see a well-rounded résumé — the candidate has worked in different business components, not just IT — then their interest is piqued.

"If I find somebody who's been an Oracle [database administrator] for 10 years, I'd be less excited about him than someone who started on IBM [database management systems], then Sybase, then Oracle," he explains.

But Cooper says he gets really excited about prospects who can make the connection between a technology accomplishment and their company's business.

Peter Stern, chief technology officer at Datek Online Brokerage Services LLC, calls this "having a clue" — an elusive factor that he says is difficult to describe but something he knows when he sees it.

Datek Online, an online trading brokerage in Iselin, N.J., has 130 workers dedicated to building, enhancing and running its Web application.

"Someone who 'has a clue' is someone who knows which technology choices are good and which are bad," Stern explains. "At the interview, we'll show a Web person a bunch of user interfaces and ask what he likes and dislikes about the interfaces. These are interfaces they've never used before."

If the candidate fiddles with the interfaces and comes up with some reasonable observations, that candidate "has a clue," Stern says.

Hence, finding that perfect employee is more art than science.

IT executives agree that most of what they're looking for is intangible. Education, certifications and training all add value, they say. But for the most part, they're looking for that intuitive feeling that this candidate will fit well into the company's culture.

Tripathi just calls it chemistry.

"I wish I could tell you we did this, this and this, and it always worked," he says. "But at the end of the day, it's magic." •

Radcliff is a contributing writer in Northern California. Contact her at DeRad@aol.com.

BY THE NUMBERS
76%
of IT leaders say they're looking for employees who take initiative



JIM ARGO

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months

IT leaders are busy with the next generation of Web sites, which must handle more customers, enhance the brand and make a profit.

By James Cope

REVVING UP E-COMMERCE

SHAILENDRA "SHELLEY" NANDKEOLYAR HAS A FULL PLATE THIS YEAR. He's vice president of e-commerce at Williams-Sonoma Inc., a San Francisco-based upscale store for kitchen and cooking items. • Ann Delligatta, chief operating officer at Autobyte.com Inc. in Irvine, Calif., is also booked with new projects. So are Kas Naderi, senior vice president of emerging technologies at Bass Hotels & Resorts Inc. in Atlanta, and most other high-level information technology executives in the U.S. • Having conquered the date-rollover demons of Y2k, these IT leaders have turned their attention to a flurry of e-commerce projects. In fact, 81 of the *Computerworld* Premier 100 IT Leaders say that working on "electronic-business infrastructure" is a mission-critical project for the next 12 months.

The stakes are high for their companies.

The pure dot-coms, such as Autobyte.com, realize that growth in revenue and earnings won't mean much without delivering a positive bottom line for shareholders.

Likewise, brick-and-mortar businesses such as Williams-Sonoma understand the need to advance their brand in the electronic space as well as through traditional sales channels — or lose market share.

And all companies — be they business-to-

business or business-to-consumer, buyer or seller — are recognizing the cost-saving benefits of online procurement of supplies. The high-level IT leaders of these aggressive companies offer valuable, and often surprising, insights into e-commerce project strategies.

From Naderi's perspective, for example, Bass Hotels is as much about information as it is about hotel and resort accommodations. Bass Hotels is really in the business of providing information to customers, making it easier

for customers to discover and utilize the services provided by company-owned and franchise properties.

Naderi says he's also in the business of providing electronic procurement for the hotels and leveraging IT to help ensure that franchisees follow a corporate code of quality.

Although brand recognition will remain important in e-commerce, just as it has in other marketing venues, "consumers are getting flooded with so many brands," he says. In his business, Naderi says, the brand concept will ultimately be overshadowed by intelligent-agent technology. He says consumers will go to portals that serve up the specific information they're seeking, instead of looking for a particular brand.

That's why he's pushing e-commerce that offers a total travel experience: hotel, car and airline tickets, all in one package. "We are focused on making our Web site more of an alliance instead of a brand site," Naderi says.

EFFECTIVE PROJECT MANAGEMENT

Effectively managing an e-commerce project hinges on three questions, Naderi says: "What business values are we bringing to the table via the electronic channel? Is the Internet the right channel vs. other links? How do we



ALAN LEVENSON

break the solution down into three or four smaller chunks?"

As e-commerce becomes business as usual, Keith Thompson, vice president of product development at OrderTrust Inc., sees more emphasis on supply-chain integration among online marketers.

OrderTrust is a Lowell, Mass.-based outsourcer that handles the back-end order processing and fulfillment for Web sites. "We find that more and more of our customers are looking for real-time capability instead of batch capability," Thompson says. That means when a consumer clicks to order a product on a Web site, he explains, the customer wants to know that the product is available on a shelf in a warehouse ready for shipping.

Diane Duggan, CIO at MCI WorldCom Inc. in McLean, Va., says the telecommunications carrier will extend its e-commerce capabilities to handle more customers this year, as well as refine the architecture of its core systems.

Duggan says MCI WorldCom will enhance its Interact product, an online facility that enables business customers to self-manage their

"We have always designed our system from the customer backward."

ANN DELIGATTA
Autobyte.com Inc.

telecommunications services. "We have 15,000 Interact users today," she says. "By the end of the year, we'll have 15,000 more."

MCI WorldCom "decommissioned several hundred applications" during Y2k remediation, Duggan notes. This makes it easier to integrate systems and connect front-

end interfaces to databases, which are items at the top of her list this year.

In addition, Duggan says her company will move forward with an all-electronic procurement strategy, which will enable it to order and pay for everything from office supplies to telecommunications equipment from major vendors. "Everything was done through paper before," she says.

As CIO, Duggan says she has to be knowledgeable and accessible at the project level, while maintaining a high-level view of IT challenges. She accomplishes this by delegating lower-priority items and getting very involved in high-priority projects. When hot projects are on the burner, Duggan says, she has reviews with project managers and teams every eight weeks.

In the early stages of a project, Duggan says, the IT people partner with involved business units to understand the problems and opportunities. "After that, we decide on the technology we need to use and do the design and development."

The technology part of e-commerce is also very important to Nandkeolyar.

But for Nandkeolyar, any project starts with a singular goal: advance the awareness of the Williams-Sonoma brand. Which isn't surprising, given that Nandkeolyar is a seasoned brand manager who won his marketing stripes working with companies such as BBDO Worldwide, Levi Strauss & Co. and American Home Products Corp.

Nandkeolyar says his focus last year was creating the Williams-Sonoma site and doing it in a way that was "consistent with what the brand was about — simple, high-end, elegant."

This year, Nandkeolyar plans to develop and launch two sites for other Williams-Sonoma brands, Pottery Barn and Pottery Barn Kids. That will mean adding staff, Nandkeolyar says. "We're at about 25 as a team right now. We plan to double."

Another priority for Nandkeolyar is making the Williams-Sonoma sites more database-driven. He explains it this way: "Ninety percent of our site is dynamic now; we want to make the rest of it that way as well. You need to be database-driven so you can change a product on the fly."

Delligatta, at Autobyte.com, is going after bigger game. A business model that started off as an easier way to get a good deal on a new car now includes the company's new AutobyteDirect. Customers can scan the inventory of affiliated dealers and make an offer online.

DESIGNING FOR CUSTOMERS

Delligatta says, "We have always designed our system from the customer backward." And this year, she says, she wants to expand the customer relationship management features of the Autobyte.com site so customers can connect with "live human beings."

Those customers aren't necessarily located in the U.S., because Autobyte.com has set its sights on overseas markets, too.

"We have been the car-buying service that has put the stake in the ground internationally," Delligatta says. "We've been doing a lot of sharing of best practices in other countries, including the U.K., Sweden, Japan. We'll move very quickly across Europe."

Because the business model and e-commerce are intertwined, Delligatta says there's one question that keeps coming up: "Do the projects reflect changes in thinking about the business model of the company?"

"Our No. 1 challenge," she says, "is to stay the leader." •

The road to IT leadership has various stops, including philosophy class, matchbook courses, wartime experience and IT snafus.

By Leslie Goff

MANY PATHS

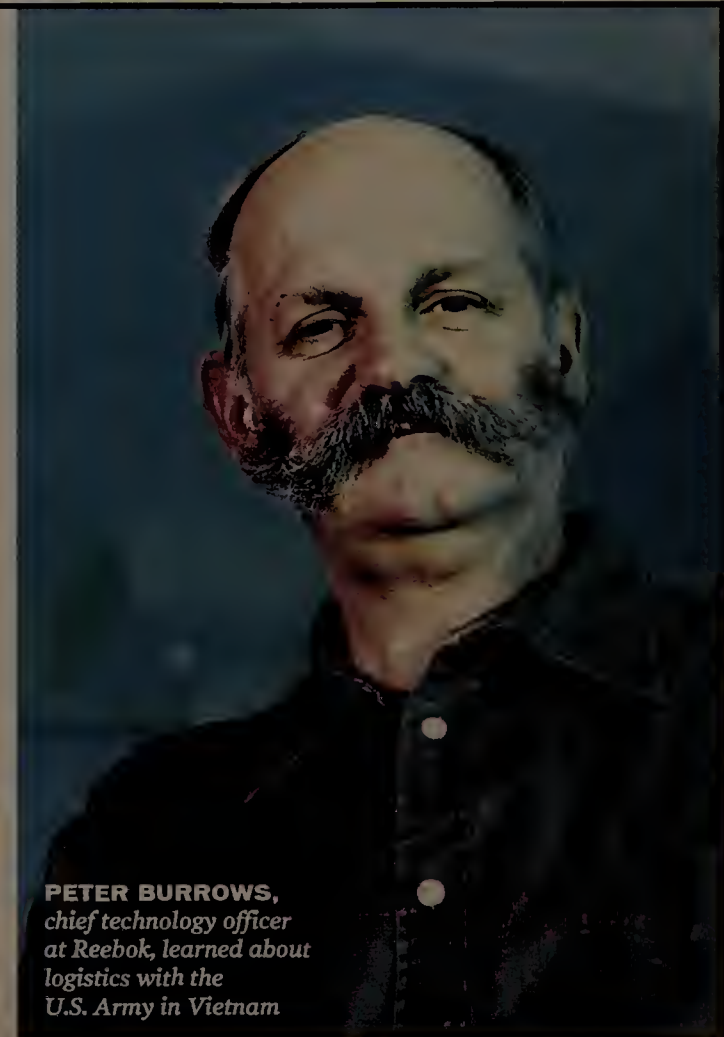
HUNKERED DOWN IN A BUNKER OUTSIDE A U.S. ARMY DATA center near Saigon night after night in 1969, Peter Burrows got a sense of what *mission-critical* is all about. A private with a data processing management degree who was called to serve in the largest draft of the Vietnam War, Burrows spent 14- to 16-hour days as a grunt programmer traveling around base camps with a Univac 1005. In one of the earliest uses of mobile distributed computing, he used a minicomputer to order food, ammo and other supplies — and manage payroll — by taking requests from the local commanders and transmitting them to a logistics command center.

"It was like getting two to three years' experience in a single year," he says. But nights were another reality. The blinking lights of the Univac gave way to the light show of rockets headed for the data center. The logistics of gathering data gave way to the logistics of making it through to another dawn.

"Every day was the contrast of enjoyment and terror, of learning and trying to stay alive," says Burrows, now chief technology officer at Reebok International Ltd. in Stoughton, Mass. "I developed an incredible sense of what it takes to get something done in the worst possible situation. You ended up developing an incredible sense of mission and your role in it, a sense of 'I will get this done no matter what happens.' No excuses."

The tenacity and sense of mission that Burrows acquired then are qualities shared by many other information technology leaders.

The variety of their routes to the top proves that there's no one path to IT success. Burrows worked in two rather unglamorous environments before ending up at one of the most recognized brand names in the world of consumer products. Some IT leaders have job-hopped, some have industry-hopped, some have stayed in the same companies their entire careers. What they share is a combi-



PETER BURROWS,
chief technology officer
at Reebok, learned about
logistics with the
U.S. Army in Vietnam

nation of chutzpah, doggedness, strategic vision, devotion to learning and an eagerness to solve problems.

PROBLEM SOLVERS

Enthusiasm for tackling problems and putting the processes in place to solve them drew Scott Heintzeman into IT from day-to-day hotel operations at Carlson Hospitality Worldwide in Minneapolis.

Heintzeman, vice president of knowledge technologies, started his career at the company at 17, riding his bicycle around town to deliver laundered sheets and towels to the Radisson South. He worked his way into hotel management and spent 10 years opening new

Radisson properties, establishing procedures and policies, training staff and moving on to the next new hotel.

In his first management gig, Heintzeman reached a turning point. It was a seemingly ordinary problem: a foul-up on a hotel VIP's reservation and check-in that the desk staff wasn't trained to handle. But it underscored a lack of sufficient processes — processes for which he was responsible.

The snafu itself "was not a life-changing event, but it created embarrassment for the hotel's general manager, and he was furious," Heintzeman recalls. "I knew I either had to pack up or rally my organization and solve the problems. I decided I was absolutely not going to fail under any circumstances. Failure wasn't an option. That was a big learning point for

Continued on P30

TRAVELED



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DO YOU KNOW

DO YOU KNOW

DO YOU KNOW



Continued from P28 me, and that philosophy and commitment have been what makes me me."

The experience served Heintzeman well when he was put in charge of an ambitious project to automate Carlson's reservation and check-in system. His team created a great system from scratch but found that "the hardware available to us was woefully inadequate to support it," he recalls. Again, failure wasn't an option, so he rallied his team. "It took a year to get the right horsepower under the software to make it perform correctly, and that was an entire year of tremendous pain and organizational discomfort," Heintzeman says. "But we all bonded together and stuck to the project until we could see our way to stabilizing the system and making it what it has become today."

Heintzeman made the full leap into IT in 1993 because he enjoys "organizing people and issues and solving problems through better processes," he explains. "And today IT is at the center of those opportunities."

BUSINESS VISIONARIES

Like that of Heintzeman, Peter Solvik's career has focused on the intersection of business and IT. The CIO at Cisco Systems Inc. in San Jose determined as an undergraduate in the late 1970s that while he loved technology, it had to serve a greater purpose. He took his then-uncommon idea to the dean of the business school at the University of Illinois and proposed a hybrid business/IT degree. In 1980, he graduated with the university's first dual bachelor's degree in business and computer science. It gave him his pick of jobs, and he joined Texas Instruments Inc. as a liaison between IT and end users.

This was just at the point when businesses were trying to increase usage of IT — and Solvik's move demonstrated his knack for being in the right place at the right time. From TI, he moved to Apple Computer Inc., just as the PC revolution was taking off. At Apple, he ran the Apple-Link group, which grew out of the Eworld project, an early attempt at an online community for Apple customers. From there, he joined Cisco just as the Internet revolution was beginning.

Solvik says he was fortunate to "land at companies that were important and dominant in the industry," which gave him a chance to "make an impact and continue learning."

CONSTANT LEARNERS

Christopher Smith takes at least a few minutes of each day to surf the Web researching a chosen topic. "I think of it as playing," he says. "If you don't do a little every day, you'll end up behind."

Keeping up with what's new is imperative: The CIO at HomeLife Furniture Corp. in Hoffman Estates, Ill., which spun off from Sears, Roebuck and Co. in February 1999,

Smith has built his career tackling new projects that his employers had never attempted before. He's reached his personal apex in his current job, where he's building HomeLife's entire IT infrastructure from scratch.

Smith has spent nearly 20 years trying the untried, most recently as supply-chain systems director at Sears, a position in which he re-engineered the software and business processes supporting the retailer's huge supply chain.

His first job after college, at a small start-up run by a former Michigan state police officer, was to develop a system for tracking missing children and identifying similarities and patterns among different cases. It was 1982 — before such systems were widespread.

"There were no models; anything I did, I had to invent for myself," Smith says. "And that attribute has carried me through every job I've ever had — there have been no instructions."

His willingness to learn and to constantly reinvent himself was what sustained him through a tumultuous year at Kmart Corp., as he made the transition from lead systems analyst into management. The challenge was to shift from being a hands-on technologist — interested in the most elegant technical solution — to being a full-fledged project manager.

"For a while, I was failing miserably," he says. "But I had a manager who was willing to ask me the tough questions like, 'Are you sure you want to do this?' And in a year, I went from being one of the worst project managers to probably one of the best. If I hadn't had that experience, I wouldn't have learned the skills necessary for my job today."

Smith says of the three subjects he studied in college — business, computer science and philosophy — philosophy has been the most advantageous to his career: "It's helped with getting to the root of what I'm really trying to say, getting to the root of solving problems and organizing arguments."

EMBRACERS OF CHALLENGE

Another Sears veteran, Joseph Smialowski, concurs that the study of philosophy provides a strong foundation for an IT career. "In philosophy you deal with a system of the world — how did it start, how do things relate to each other?" says Smialowski, now vice chairman at Fleet Boston Financial Corp. in Boston. "And that big-picture aspect has helped me, as has



MARC BERLOW

"I enjoy organizing people and issues and solving problems through better processes."

SCOTT HEINTZEMAN
Carlson Hospitality Worldwide

the logical aspect that you go through in philosophy." Smialowski has specialized in turnarounds, starting with himself. In college he'd planned to become a philosophy professor, but after graduating, he realized that "in 1971, there wasn't a large demand for folks in philosophy programs."

So Smialowski enrolled in an eight-month technology training program, "one of those schools you find on the back of a matchbook cover." He got his first programming job at Hartford Insurance Co., parlayed that into a job at Xerox Corp. and earned a techno-MBA from Rochester Institute of Technology.

The would-be philosopher next joined the Price Waterhouse consultancy, where "we were constantly called into situations where the business was in trouble and the common theme was they had lost sight of who their customer was or how important the people in their organization were," Smialowski says.

He embarked on a series of challenges to get clients back on track, and when one customer — Saks Fifth Avenue's Arthur Martinez — took the helm at Sears, he brought Smialowski onboard. The retailer's turnaround is by now legendary.

"I've never refused a challenging assignment, and my willingness to take on challenges has led me to where I am today," Smialowski says. "No matter how difficult or ugly they might look, in those situations lies opportunity." •

Goff is a Computerworld contributing writer in New York.

BY THE NUMBERS
49%
of IT leaders have a graduate degree (such as an MBA)



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IT leaders give their employees plenty of feedback, training and freedom to grow.
By Sharon Watson

CULTIVATING THE IT STAFF

JOHN VOELLER SAYS HE'S A GARDENER OF IDEAS. FOR EXAMPLE, VOELLER, THE chief technology officer at BV Solutions Group Inc., recently came back from a seminar on XML Query Language (XQL) and afterward chatted with his information technology team about what he'd learned. Within five days, the IT group had sprouted a team to study how the company might use XQL. "I didn't give any assignments; [I] just planted the seed," Voeller says. "I bring in ideas, practices and perspectives, and they're guaranteed to grow in this environment."

That environment -- in which IT professionals have the confidence to take ideas and run with them -- is largely the result of Voeller's cultivation.

"John's constantly baiting people about what's coming and asking how we will adapt to it," says Jerry White, CEO of Overland Park, Kan.-based BV Solutions and a friend of Voeller's for 20 years. BV Solutions is the IT arm of Black & Veatch, a large engineering and construction firm in Kansas City, Mo.

"He's also a people-person extraordinaire," White says. "That's what John lives for -- to work with people."

Yet Voeller's human garden yields bottom-line results: Black & Veatch's IT accomplishments were so advanced for the construction and engineering industry that the company spun off the BV Solutions Group as an independent consultancy -- one that has gone up against the Big Five accounting firms and won.

In short, Voeller has the qualities that many IT leaders say are key to creating an optimal work environment:

- An excellent grasp of technology, combined with sharp business skills.
- The confidence to let bright people grow their own ideas and the skill to prune so that the best ideas flourish -- without stunting the development of others.
- A genuine interest in helping people, from operations staff to key managers, grow personally and professionally.

IT leaders say it's paramount that they demonstrate such characteristics. "IT is very people-intensive, and it's tremendously creative. It may yield wonderful things or absolute disaster," says Scott Dinsdale, chief technology officer at FirstLook.com Inc., a music Web site in Sherman Oaks, Calif.

Dinsdale points out that demand for great IT professionals far outstrips the supply. "If CIOs don't care a lot about and

focus on their people, they're screwed," he says.

IT leaders use a combination of tactics and skills to take care of their staff. They range from loosely structured IT departments and personal mentoring to continually offering training in business and technology topics. All are passionate about communicating and feedback. Finally, many say their companies' commitment to such values as respect and integrity is critical to their success.

TOPPLING HIERARCHIES

Most IT leaders say creating fertile environments for innovation requires that they plow under old IT department structures. "If you want teamwork and results, you must remove the forces that prevent them," says Robert Rodin, who was CEO of Marshall Industries before its acquisition last October by Avnet Inc., an electronics company in Phoenix.

For Rodin and other IT leaders, that means running IT departments on matrices instead of hierarchies. Titles are loose or nonexistent because IT professionals take lead roles on some projects and subordinate roles on others. The result: IT professionals with wide-ranging skills who work well on teams.

Individuals also are able to grow faster because their management and technical skills can be stretched *Continued on P36*

TRAINING

BV SOLUTIONS' JOHN VOELLER: *"I bring in ideas, practices and perspectives, and they're guaranteed to grow in this environment"*



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Care Deeply About Your People

In addition to leading global IT initiatives for The Home Depot Inc., CIO Ron Griffin spends a lot of time in new-employee orientation classes, discussing the company's value system.

"If you get their heads and hearts in the right place, the rest will take care of itself," Griffin says.

Those who work with Griffin say his attitude is a key part of his leadership success. "You can tell it's not an act," says Paul Hoedeman, vice president of information services at Atlanta-based Home Depot. "Ron cares deeply about people, and his door is open to everyone."

Others who work for and with successful IT leaders repeat a similar theme: Their bosses have a deep, genuine interest in their employees' personal and professional development — and that's an environment in which employees can grow.

Genuineness, trustworthiness and the ability to take and give feedback well are the top three qualities of a leader, according to a survey of 2,000 clients of the Growth & Leadership Center, a Mountain View, Calif.-based consultancy.

"Being genuine means being congruous, telling the truth and being consistent," says Jean Hollands, CEO and founder of the center. "It takes real guts."

— Sharon Watson

A Hands-Off Style Wins

Keep your hands off until they start to hang themselves — most IT leaders say that's their management style.

To encourage the best thinking and freshest ideas, they create a work environment in which people feel comfortable expressing themselves rather than feeling like they have to ask permission every time a synapse fires.

"It's a directed democracy," says Scott Dinsdale, chief technology officer at music Web site FirstLook.com. "There's a vision and a destination but not a dictatorship. Everyone has a voice."

Some IT leaders say they balance freedom and control by challenging employees to find solutions — but within set boundaries.

"We meet to make sure we're putting customer issues first," says Kenneth Jaffe, CIO at Equitable Distributors. "Managers take it from there."

"Ken's the most flexible person I've ever worked for when it comes to new ideas," says Graham MacRobie, manager of Java development at Equitable. "He's less concerned with how the job gets done, so long as it's done well."

IT leaders say they need to know when to impose a decision — for example, if employees are at odds. But they find that usually, when given freedom, IT professionals deliver the solutions.

"We know Ken will back us if we try something risky," MacRobie says. "So people really push the envelope; they're inspired to do their best work." — Sharon Watson

Continued from P32

sooner by giving them smaller projects to lead. "If you have to wait until a person reaches a certain level before you can challenge them, you wind up with a stunted plant," Voeller says.

The IT leaders also emphasize the need for frequent, forthright communication to ensure success in these less-structured environments.

At The CIT Group Inc., a New York-based commercial finance company, CIO John J. Fischer Jr. has organized his IT staff into six teams, each aligned with a specific business unit.

He meets once a month with the head of each team to review project activities and then with both the team leader and the head of the business unit to which the team's assigned.

Fischer also informally meets with individuals on each team to get a feel for "off-line" issues, such as matters dealing with personnel and strategy. Plus, he hosts a quarterly "town hall" meeting for his 700 IT staffers.

"It's really about getting in front of people," Fischer says. IT professionals need to know how their projects affect the overall business and whether they're meeting expectations, he says.

During the town hall sessions, Fischer says he reviews major issues, discussing projects and new applications. "It's critical for a leader to be an excellent communicator," he says.

TRAINING AND MENTORING

IT leaders say getting the best performance from good people also requires that they receive regular, honest feedback about their individual performances.

At The CIT Group, individuals, teams and leaders all have defined accountabilities and goals that are reviewed with each employee every quarter.

"You can't micromanage. You need to free and empower, but you also have to measure," Fischer says.

Feedback must be reciprocal, IT leaders say, with managers and employees letting their bosses know how they're doing, too. "It's fundamental that people know how they're doing, whether they're satisfying expectations," Voeller says. "That information gives them the confidence to leap ahead."

Managers say this process helps them understand what kind of training their departments need to help resolve both technical and management issues.

Most employees working for IT leaders



KENNETH JAFFE uses mentoring to help grow managers from programming staff

receive as much as two weeks per year of technical training, usually conducted by outside firms. Some leaders also conduct the training themselves, usually in management areas, but sometimes in IT basics.

Kenneth Jaffe, CIO at Equitable Distributors Inc., in Newport Beach, Calif., has led sessions in programming methodology and documentation. "It's stuff younger programmers don't seem to have heard of but that we need," Jaffe says.

IT TAKES TEAMWORK

IT leaders say they focus most of their management-level training on teamwork issues. "Everyone needs to understand we are more effective as a team than as individuals," Fischer says. He and 40 of his IT managers worked with an outside vendor to create a teamwork and team-building annual training session that all IT staff must attend.

Jaffe sends his management staff to Bordeaux, France, for an annual team-building program that's run by Equitable's parent company, AXA Group.

"They wanted to retrain management to be risk-taking and dynamic," says Jaffe, noting that those aren't qualities usually associated

with the insurance industry.

The training, Jaffe says, has helped his staff of 15 create many innovative solutions — such as a Java-based, real-time quote system — that support 190 sales representatives, who booked \$22 billion in sales in fiscal 1999.

Jaffe also uses mentoring to help grow managers from the programming staff. While The CIT Group and Equitable Distributors assign mentors to newer employees, most IT leaders say they primarily use informal mentoring, offering advice when it seems needed and always providing it on request.

"I have yet to see a formal mentoring program work," says Dinsdale at FirstLook.com. "They're too contrived. People develop natural affinities to other people." •

Watson is a freelance writer in Chicago.

BY THE NUMBERS
61%
of IT leaders are personally involved in a company mentoring program



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INSIGHTS

Margaret Schweer
(Kraft Foods) has a doctorate in sociology from Purdue University.

Before his IT career, **Ulrich J. Seif** (National Semiconductor) ran a winery.

Ralph Szygenda
(General Motors) offers this advice to future IT leaders: "Lead change - don't be overcome by change."

Most Premier 100 IT Leaders say they get their best ideas from their IT staff and from peer companies.

David Cooper (Lawrence Livermore National Laboratory) got his start as a research scientist at NASA.

Ed Toben (Colgate-Palmolive) says his dream job would be center fielder for the New York Yankees.

For Premier 100 IT Leaders, the No. 1 criterion for selecting an IT vendor is **product support**.

Dawn Lepore (Charles Schwab) has a degree in music from Smith College.



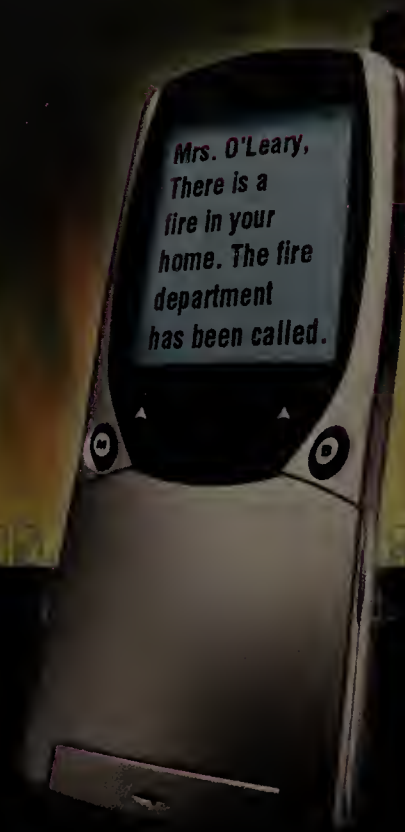
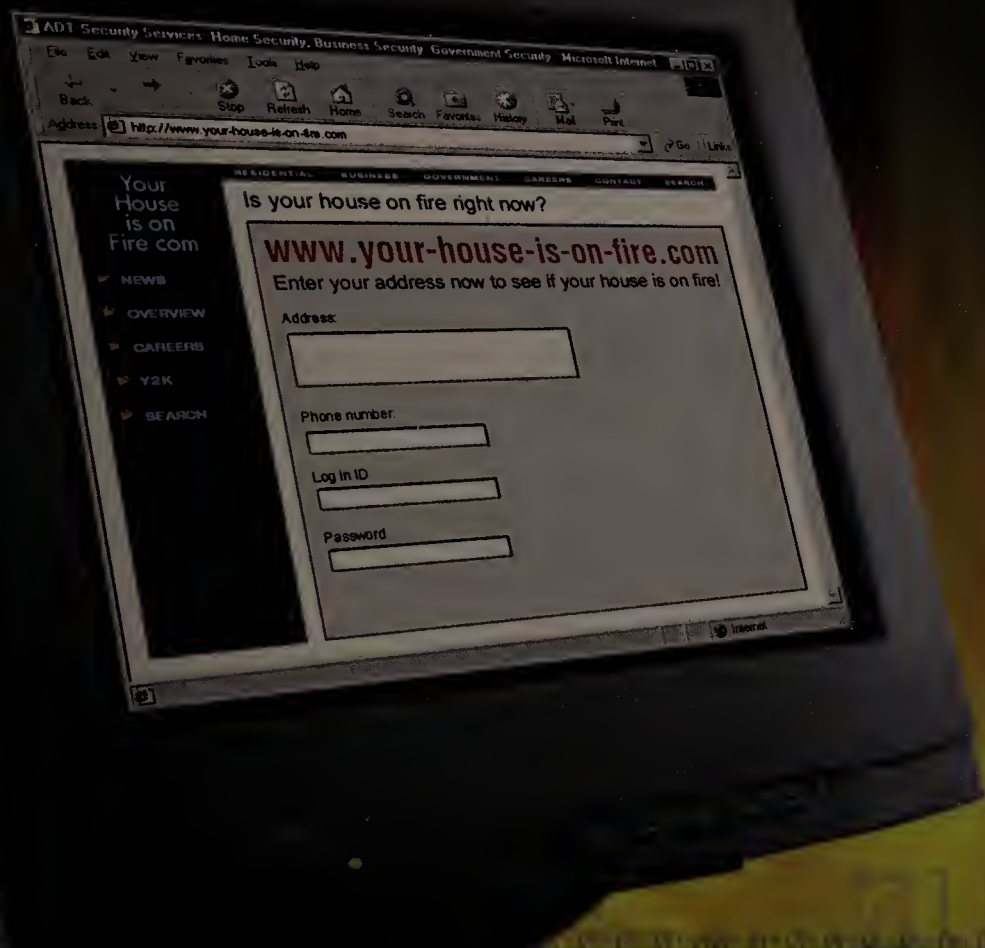
DAWN LEPORE

The people who
matched *Computerworld's*
IT Leadership Index,
in alphabetical order:

PREMIER 100 IT LEADERS

| TOP 100 | COMPANY (AT TIME OF SURVEY) | WORK EXPERIENCE (YEARS) | TOTAL EMPLOYEES MANAGED | TOTAL USERS SUPPORTED | LEADERSHIP STYLE (KEY, P46) |
|--|---|-------------------------------|-------------------------------|-----------------------------|---|
| Automotive | | | | | |
| Ann Delligatta Chief operating officer | Autobyte.com Inc. www.autobyte.com | 25 | 50 | 3,500 | Established, Focused, Adviser, Innovator |
| Thor Ibsen , vice president, North American consumer e-commerce | Ford Motor Co. - eConsumer Group www.ford.com | 11 | 46 | N/A | Contemporary, Diverse, Coach, Innovator |
| Ralph Szygenda CIO | General Motors Corp. www.gm.com | 29 | 1,700 | 397,000 | Veteran, Dynamic, Commander, Innovator |
| Jim Woodward Corporate controller | Dana Corp. www.dana.com | 24 | 200 | 23,000 | Established, Diverse, Coach, Innovator |
| Business Services | | | | | |
| Shahla Butler Director, AMS Center for Innovation, Director, AMS Center for Advanced Technologies | American Management Systems Inc. www.amsinc.com | 25 | 100 | 8,000 | Established, Dynamic, Coach, Innovator |
| Brian Farrey Chief technology officer | Monster.com www.monster.com | 16 | 60 | 500 | Established, Focused, Adviser, Innovator |
| Chris Horrocks Vice president, technology | CEO Express Co. www.ceoexpress.com | 38 | 18 | 45,000 | Veteran, Diverse, Coach, Innovator |
| Michael J. Iandoli President | TAC Worldwide Cos. www.ttac.com | 35 | 75 | 1,500 | Veteran, Diverse, Coach, Innovator |
| Dennis H. Jones ** CIO | Federal Express Corp. www.fedex.com | 26 | 7,000 | 186,000 | Veteran, Diverse, Coach, Maverick |
| Carolyn Leighton-Tal Chairwoman and founder | Women in Technology International Inc. www.witi.com | 25 | 15 | 20 | Veteran, Dynamic, Coach, Conservative |
| John T. McCreadie CIO | Ernst & Young International www.ey.com | 30 | 1,400 | 40,000 | Veteran, Focused, Commander, Innovator |

If your E-Business
reaches customers
only on the Web,
your customers
could get burned



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Q&A

John Boushy

Champion of an over-budget project

By Monica Sambataro

No one had ever launched a customer recognition program for casinos before John Boushy tried it in 1994. Boushy, senior vice president of brand operations and information technology at Harrah's Entertainment Inc., talked to *Computerworld* about how his leadership skills and passion for the database project – even after it was late and over budget – made Memphis-based Harrah's a big winner in Las Vegas.

[cw] Define leadership.

Leadership is about getting people's hearts first, heads second and wallets third [in order of priority] linked up with the desired outcomes. When a person's heart is really in it, the motivation's just there. Yet it's so much easier [for managers] to do that in reverse order. What I strive to do is work the heart and the head simultaneously.

[cw] Describe a situation in which you had to rely on your leadership skills.

We embarked in 1994 on a \$17 million project to build the casino industry's first national customer database. About two years into the project, [we found] it was going to take longer than we thought and it was going to cost [\$18 million]. On the IT side, leadership skills were really about continuing to motivate the team that was in the midst of all these issues you get into when ever you're building new technologies. It was about, "This isn't something that's going to beat us; we're going to beat it. . . . We're going to do something that nobody else in our industry is able to do today."

[cw] What was at stake?

It was the single largest IT investment Harrah's, at the time, had ever made – by a factor of about three. We were not only spending more money than we [initially] thought, but we were spending more money on a project that – while there was a belief [the benefits] would be there – there was no hard-and-fast example that we could look at that said, yes, this will pay for itself. I was passionately convinced that this was the right thing for the business to do. And the end story is, fortunately, I'm still here. It not only met our expectations, but it wildly exceeded them by about a factor of five.

[cw] What kind of risks did you have to take?

I looked senior people in the eyes and said, "We're going to do this, and if we don't do this, you have the wrong person in charge of IT." I put my reputation on the line, and my career. •

| TOP 100 | COMPANY (AT TIME OF SURVEY) | WORK EXPERIENCE (YEARS) | TOTAL EMPLOYEES MANAGED | TOTAL USERS SUPPORTED | LEADERSHIP STYLE (KEY, P46) |
|---|--|-------------------------------|-------------------------------|-----------------------------|---|
| Business Services | | | | | |
| Tim Talbot Vice president, technology management | PHH Vehicle Management Services www.phh.com | 14 | 65 | 1,500 | Contemporary, Focused, Adviser, Innovator |
| Tommi A. White Administrator and technology officer | Kelly Services Inc. www.kellyservices.com | 28 | 330 | 5,000 | Veteran, Diverse, Adviser, Innovator |
| Computer Services | | | | | |
| James E. Barry Jr. President and CEO (CIO) | Last Minute Integrators LLC www.lastminuteintegrators.com | 14 | 11 | 1,000 | Contemporary, Dynamic, Coach, Innovator |
| Bruce C. Carver , vice president, Information management and technology | The Reynolds and Reynolds Co. www.reyrey.com | 17 | 50 | 1,100 | Established, Diverse, Coach, Innovator |
| Tobias Ford Director, product engineering | USInternetworking Inc. www.usi.net | 10 | 14 | 50,000 | Contemporary, Dynamic, Commander, Innovator |
| Rene Larrave President and CEO | Tactica Technology Group Inc. www.tacticatech.com | 20 | 100 | 100 | Established, Diverse, Coach, Innovator |
| Mark Mathias President | EurekaDigital www.eurekadigital.com | 24 | 10 | 15 | Veteran, Diverse, Commander, Innovator |
| Janet McCabe * Vice president | Saba Software Inc. www.saba.com | 30 | Unavailable | 300 | Veteran, Focused, Adviser, Innovator |
| Keith Thompson Vice president, product development | OrderTrust Inc. www.ordertrust.net | 19 | 80 | 950 | Established, Diverse, Coach, Innovator |
| Defense/Aerospace | | | | | |
| Clifford M. Purington Manager, learning and development | Rockwell Collins Inc. www.collins.rockwell.com | 25 | 15 | 14,000 | Established, Dynamic, Coach, Innovator |
| Eric Singleton Director, global e-businesses | Raytheon Co. www.raytheon.com | 15 | 6 | 100,000 | Contemporary, Diverse, Coach, Innovator |
| Energy/Utilities | | | | | |
| Boris R. Bosch Manager, database administration | Entergy Services Inc. www.entergy.com | 25 | 22 | 5,000 | Established, Focused, Coach, Conservative |
| Tim Byers CIO | Shell Energy Services Co. www.shellenergy.com | 20 | 60 | 100 | Established, Focused, Commander, Innovator |
| Richard L. Hudson CIO | Global Marine Inc. www.glm.com | 39 | 34 | 1,112 | Veteran, Focused, Coach, Maverick |
| John Keast * CIO | PG&E Corp. www.pge-corp.com | 27 | 1,600 | 23,500 | Veteran, Dynamic, Coach, Innovator |
| Federal, State and Local Government | | | | | |
| Elizabeth Boatman CIO | City of Chicago www.ci.chi.il.us | 18 | 100 | 17,000 | Established, Focused, Coach, Innovator |
| David Cooper CIO | Lawrence Livermore National Laboratory www.llnl.gov | 37 | 1,200 | 6,000 | Veteran, Diverse, Adviser, Innovator |
| Dr. Shereen G. Remez Chief knowledge officer | U.S. General Services Administration www.gsa.gov | 30 | 200 | 14,000 | Veteran, Diverse, Coach, Innovator |
| Finance/Insurance/Real Estate | | | | | |
| Scott G. Abbey CIO | PaineWebber Inc. www.painewebber.com | 26 | 1,000 | 18,988 | Veteran, Focused, Coach, Innovator |
| Gregor Bailar CIO | Nasdaq Stock Market Inc. www.nasdaq.com | 15 | 1,700 | 4,500 | Contemporary, Diverse, Coach, Maverick |
| Robert E. Bruce * CIO | Allmerica Financial Corp. www.allmerica.com | 27 | 1,000 | 5,500 | Veteran, Dynamic, Coach, Innovator |
| Irene Dec *** Vice president, information systems | The Prudential Insurance Company of America www.prudential.com | 26 | 87 | 65,000 | Veteran, Focused, Commander, Conservative |
| Jim Donehey * CIO | Capital One Financial Corp. www.capitalone.com | 28 | 2,180 | 15,000 | Veteran, Dynamic, Adviser, Maverick |
| Ron Edgington Officer, technology and marketing services | Nationwide Insurance Co. www.nationwide.com | 17 | 1,287 | 50,000 | Established, Focused, Coach, Innovator |
| John J. Fischer Jr. CIO | The CIT Group Inc. www.citgroup.com | 25 | 720 | 7,500 | Established, Diverse, Commander, Innovator |

| TOP 100 | COMPANY (AT TIME OF SURVEY) | WORK EXPERIENCE (YEARS) | TOTAL EMPLOYEES MANAGED | TOTAL USERS SUPPORTED | LEADERSHIP STYLE (KEY, P46) |
|---|--|-------------------------------|-------------------------------|-----------------------------|---|
| Finance/Insurance/Real Estate | | | | | |
| Tsvi Gal * Chief technology officer | Merrill Lynch & Co. www.ml.com | 23 | 3,300 | 75,000 | Established, Focused, Commander, Innovator |
| Kenneth Jaffe CIO | Equitable Distributors Inc. www.equidist.com | 13 | 15 | 40,000 | Contemporary, Diverse, Coach, Innovator |
| Allen Jost Vice president | eHNC Inc. www.hncais.com | 20 | 12 | N/A | Veteran, Focused, Commander, Innovator |
| Dawn Lepore Vice chairman and CIO | Charles Schwab & Co. www.schwab.com | 27 | 2,800 | 16,000 | Veteran, Focused, Coach, Innovator |
| Rick Nolle Vice president, systems | Reinsurance Group of America Inc. www.rgare.com | 12 | 15 | 500 | Established, Dynamic, Coach, Innovator |
| Ralph Nordstrom Data warehouse architect | Automobile Club of Southern California www.aaa-calif.com | 30 | 10 | 100 | Veteran, Focused, Commander, Conservative |
| Abroo Shah Senior vice president | Liberty Brokerage Inc. www.libnet.com | 24 | 60 | 400 | Established, Focused, Commander, Conservative |
| Joseph Smialowski Vice chairman | FleetBoston Financial Corp. www.bkb.com | 27 | 2,500 | 60,000 | Veteran, Focused, Coach, Innovator |
| Peter Stern Chief technology officer | Datek Online Brokerage Services LLC www.datek.com | 10 | N/A | 1,000 | Contemporary, Focused, Commander, Conservative |
| William S. Wallace CIO | First USA Bank NA/WingspanBank.com www.wingspan.com | 15 | 1,000 | 15,000 | Contemporary, Diverse, Commander, Innovator |
| Lynn R. Weaver Executive vice president, operations | Waterfield Mortgage Co. www.waterfield.com | 26 | 65 | 1,100 | Veteran, Diverse, Commander, Innovator |
| Food Industry | | | | | |
| Gary Cooper Vice president, information systems | Tyson Foods Inc. www.tyson.com | 19 | 275 | 8,500 | Established, Focused, Adviser, Innovator |
| Debbi Gillotti Acting CIO and general manager, Starbucks Internet Strategies | Starbucks Corp. www.starbucks.com | 21 | 350 | 35,000 | Established, Diverse, Coach, Innovator |
| Maria Mann IT director, knowledge management | Vlasic Foods International Inc. www.vlasic.com | 15 | 15 | 2,000 | Contemporary, Focused, Adviser, Innovator |
| Jim Prevo CIO | Green Mountain Coffee Inc. www.gmci.com | 25 | 12 | 350 | Established, Diverse, Commander, Maverick |
| Margaret Schweer Director, human resources | Kraft Foods Inc. www.kraft.com | 15 | N/A | 36,500 | Contemporary, Focused, Coach, Conservative |
| Manoj Tripathi CIO | Jamba Juice Co. www.jambajuice.com | 17 | 14 | 1,000 | Established, Diverse, Adviser, Innovator |
| Health/Medical Services and Pharmaceutical | | | | | |
| Ketty Y. Brown Department head, business information systems, Clinton Labs | Eli Lilly and Co. www.lilly.com | 22 | 10 | 1,000 | Veteran, Diverse, Coach, Conservative |
| Paul LeFort CIO | UnitedHealth Group Corp. www.uhc.com | 37 | 3,200 | 30,000 | Veteran, Focused, Coach, Innovator |
| Hugh McCabe Director, health care analysis | Univera Healthcare www.univerahealthcare.org | 15 | 7 | 150 | Veteran, Focused, Adviser, Conservative |
| Steven Shim Director, technical services | Health First Inc. www.health-first.org | 12 | 40 | 4,800 | Contemporary, Focused, Coach, Innovator |
| Don Stoller Director, information management | Owens & Minor Inc. www.owens-minor.com | 23 | 12 | 700 | Established, Diverse, Coach, Innovator |
| Kathy Brittain White CIO | Cardinal Health Inc. www.cardhealth.com | 20 | 1,500 | 35,000 | Established, Focused, Coach, Conservative |
| Manufacturing (Discrete, Process and Computer-Related) | | | | | |
| Keith Bishop Senior vice president, supply chain and MIS | Fruit of the Loom Inc. www.fruit.com | 20 | 100 | 3,000 | Established, Focused, Adviser, Conservative |
| Chris Borneman Chief technology officer | Commerx Inc. www.commerx.com | 10 | 25 | 100 | Contemporary, Focused, Commander, Innovator |
| Peter Burrows Chief technology officer | Reebok International Ltd. www.reebok.com | 30 | N/A | 6,500 | Veteran, Focused, Coach, Innovator |
| Mark Dunkle Director, product management and Core Applications Group | Applied Materials Inc. www.appliedmaterials.com | 20 | 3 | 13,000 | Established, Focused, Coach, Innovator |

Q&A

Jim Donehey

Learning from Hannibal's march on Rome

By Monica Sambataro

Capital One Financial Corp. in Falls Church, Va., depends on its information technology staff to build value using customer information systems. In his five years as CIO at the financial services firm, Jim Donehey has seen his staff grow from 50 full-time employees and 100 contractors to more than 1,800 IT associates and 400 contractors. Before he retired in February, Donehey talked about the challenges of leading an IT organization that's undergoing explosive growth in the midst of an IT labor crunch.

[cw] Define leadership.

In almost a textbook sense, it's to lead an organization to a common objective. The general Hannibal, when he was marching on Rome, for example, didn't tell people how to get over the Alps. He told them why it was important that they do that and then followed on with the statement: Either find a way or make one.

So leadership is getting people to believe in the direction the leader is asking his people to go, and that requires more than just a logical conclusion. There's a lot more emotion and passion that goes into it.

[cw] What's at stake in this struggle for IT talent?

We're an information-based strategy business. The information we maintain [and] gather about our customers requires the technology and IT organization to be in an almost constant state of flux. If we cannot attract and retain the highest-quality talent, it's only a very short amount of time before we're out of business because of the way this market moves. The acquisition of new people is the harder problem. I've managed to create a culture within the IT organization and within [Capital One] that treats IT professionals as peers with the marketing and operations groups. I look at people within the IT world as earnings-generating assets, as opposed to expenses. That provides a huge sense of empowerment.

[cw] How has your background helped?

In the 20-plus years that I've been in IT [including five at Capital One], I've worked in many different industries. Every one provides a different perspective on how you employ technology to solve business problems. What [business managers] care about is [whether] technology makes the business better, faster, higher quality. If you can't put a business case behind it, don't do it. •

Sambataro is a freelance writer in Salem, N.H.

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June 19-21, 2000
Marriott Desert Springs
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Palm Desert, CA

Key Topics:

- **Leadership**
- **E-Commerce**
- **Security**
- **Innovation**
- **ASPs**
- **E-Customers**
- **Hiring**

CONFERENCE AGENDA

Sunday, June 18, 2000

12:00pm - 5:00pm

Registration

7:00pm - 9:30pm

Pre-Conference Networking Reception

Monday, June 19, 2000

8:30am - 9:00am



Welcome and Opening Overview
Maryfran Johnson, Editor-in-Chief
Computerworld

9:00am - 9:45am



Opening Keynote: "IT Leadership vs. E-Leadership"
Charlie Feld, E-Leader and former CIO, Delta Airlines
CEO, The Feld Group

10:00am - 11:30am



"The Naked Truth About B2B E-Commerce"
Kevin Fogarty, Business Editor, Computerworld

Moderator

Panelists:

Robert Schwartz, VP & GM
Panasonic Corp.
Kathy Brittain-White, CIO & EVP
Cardinal Health (cardhealth.com)
Peter Burrows, CTO
Reebok International
John Keast, CIO/CTO
NetworkOil
Bruce Carver, VP of Informational
Management and Technology
Reynolds & Reynolds

Everybody's talking about business-to-business collaboration as the hottest of the online trends in 2000. But many feel this emperor still has no clothes. This panel will cut through the hype surrounding e-marketplaces, answering some critical questions on the benefits versus the risks. Should your company participate in someone else's B2B marketplace or create your own? When and how do you measure ROI when you're executing at Internet speed? There are multiple decision points for entry into Web-based collaboration, including infrastructure concerns, business application readiness and trust issues between trading partners. As these new business and organizational models evolve, what are the key factors your company must consider? Can it really promote higher sales or lower your production costs? IT leaders from several industries will share their successes and candidly discuss the pitfalls of B2B e-commerce in this interactive session.

11:30am - 12:15pm



Insider View: "Raytheon Corp.'s Unfolding E-Business Strategy"
Eric Singleton, Director of Global E-Business
Raytheon

12:30pm - 1:45pm

Interactive Luncheon with IT Leaders

2:00pm - 3:30pm



"Enterprise Security: Will Only the Paranoid Survive?"
Priscilla Tate, President
Technology Managers Forum

Moderator

Panelists:

Scott Charney
former head of computer crime
investigations, U.S. Department of
Justice and now Partner
PricewaterhouseCoopers
Allan Paller
Columnist, Computerworld
and Research Director, SANS
Tim Talbot, VP of Technology
Management, PHH Vehicle Management
Service

The costs of electronic attacks and security breaches are rising sharply, more than doubling each year into hundreds of millions of dollars. Every week, it seems, a new high-profile victim joins the list of companies that failed to protect themselves and their customers. Never have the business imperatives of secure commerce been so prominently in the spotlight. For IT leaders, the issues go beyond technical concerns. What are your company's legal liabilities when customer data is compromised? How do you get past political wrangling over budget allocations for security products? What are the questions you should be asking inside your own company -- of your outsourcers or suppliers? This session will explore enterprise security in depth, drawing out examples, ideas and action items from our expert panelists.

3:30pm - 4:15pm



Afternoon Keynote: "Innovation & Change"
Thornton May, VP of Research
Cambridge Technology Partners

4:30pm - 5:30pm

Premier Sponsor Breakout Sessions 1 and 2

5:30pm - 8:30pm

Expo Open and Reception/Buffer Dinner

For more information or to register visit www.computerworld.com

CONFERENCE AGENDA

Tuesday, June 20, 2000

8:45am - 9:00am

Remarks and Day Two Overview

9:00am - 9:45am



Keynote

David Lord, CEO
Toysmart.com

10:00am - 11:30am



"ASPs: The Double-Edged Sword of Outsourcing"

Mark Hall, West Coast Bureau Chief
Computerworld

Moderator

Panelists:

Dick Hudson, CIO
Global Marine

John Voeller, CKO, CTO & SVP
Black & Veatch

Sateesh Lele, President
Lele Consulting Group

Tsvi Gal, CIO, CTO & VP of Mergers
and Acquisitions, GBS

Mark Mathias, President
Eureka Digital

James Lubinski, EVP
Galileo International

This latest trend is both an option and an obstacle. As the application service provider market grows beyond the small to medium business space to take advantage of enterprise-class software, IT leaders are considering ASPs as a serious tool in their technology strategies. Yet will these outside vendors offer sufficient security for your IT operations? Can you control point product offerings from ASPs? How do you insure that ASPs deliver on service level agreements? Will today's high-flyers crash to earth and take your company with them? This panel session will nail down the critical success and failure points, and answer the most pressing and provocative questions that ASPs raise for IT executives.

11:30am - 12:15pm



Featured Speaker

Peter Solvik, CIO
Cisco Systems

12:30pm - 2:00pm

Buffet Lunch and Expo Open

2:00pm - 3:30pm



"Walking the E-Customer Tightrope"

Julia King, Senior Editor
Computerworld

Moderator

Panelists:

Cathy Hotka, VP
Retail Federation

Joseph S. Laowski
Vice Chairman
Fleet Boston Financial

Robert R. Loe, CIO
Atoc, North America

Mark R. Loe, CIO
& Vice President
Atoc

Technologies such as data mining and customer relationship management software can put your company right in its customers' pockets, not only anticipating their current needs but discovering new ones. But where does e-business cross over that line between customer knowledge into invasion of privacy? Does your company know how to walk this tightrope without falling off? What are the best strategies for leveraging and managing high-impact business data without alienating customers along the way? How are leading companies using technology to sustain old relationships while developing lucrative new ones? Does online customer service differ from the traditional approach? This panel session will explore the positives and the perils of the customer connection.

3:30pm - 4:15pm



Insider View: "Taking Care of E-Customers at Autobytel"

Ann Delligatta, COO
Autobytel.com

4:15pm - 4:45pm

Premier Sponsor Breakout Session 3

4:45pm - 6:30pm

Expo Open and Reception

7:00pm - 9:00pm



Premier 100 Awards Presentation and Gala Dinner

Featured Keynote: Jim Yost, CIO
Ford Motor Company

Wednesday, June 21, 2000

8:45am - 9:00am

Remarks and Closing Day Overview

9:00am - 10:30am



"How to Win the Hiring War Between the 'Dots' and the 'Nots'"

David Weldon, Careers Editor,
Computerworld

Moderator

Panelists:

Irene Dec, VP of International
Investments, Prudential Insurance Co.

Margaret Schweer, HR Director
Kraft Foods

Robert Bruce, CIO
Allmerica Financial

David Foote, Managing Partner
Foote Partners LLC

Jim Prevo, CIO
Green Mountain Coffee

Fran Quittel, Columnist
Computerworld

Many traditional companies are reeling from the impact of the dot-com drainpipe, as sexy little startups pull top talent from their employee ranks. Beyond the stock options and the thrill of new ventures, what are dot-coms offering that your company may be overlooking? Are you talking about career development, or droning on about employee retention? How can you "steal" from your own staff in other divisions to enrich and strengthen the technology operation? What kind of employee referral programs really work? We'll hear from both sides of the debate in this lively, provocative discussion of hiring, head-hunting and holding onto the best IT people in a sizzling job market.

10:30am - 11:15am



Closing Keynote: "Putting All the Pieces Together: The E-Management Difference"

Peter Keen, Author, *The eProcess Edge*, and Chairman
Keen Education

Travel & Accommodations

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INSIGHTS

49% of the Premier 100 IT Leaders have graduate degrees.

Dick Townsend (*Deere*) and **John W. Plummer** (*Corning*) got their starts in the mail room.

Richard L. Hudson (*Global Marine*) says his dream job is to be "chairman of my own trust fund for charitable giving."

Premier 100 IT Leaders say the most important quality for a manager is the **ability to motivate**, followed by **strong communication skills**.

Clifford M. Purington (*Rockwell Collins*) was previously an air traffic controller.

Advice from **Cathy Hotka** (*National Retail Federation*) for future IT leaders: "**Spend more time talking with each other!** Too many IT decisions are made without adequate vetting by colleagues. Information exchange among CIOs results not only in better implementations but also in useful feedback to technology companies."

Robert M. Rubin (*Elf Atochem*) was previously a laboratory physicist.

ROBERT M. RUBIN

| TOP 100 | COMPANY (AT TIME OF SURVEY) | WORK EXPERIENCE (YEARS) | TOTAL EMPLOYEES MANAGED | TOTAL USERS SUPPORTED | LEADERSHIP STYLE (KEY, P 46) |
|--|---|-------------------------------|-------------------------------|-----------------------------|--|
| Manufacturing (Discrete, Process and Computer-Related) | | | | | |
| Robert M. Rubin * CIO | Elf Atochem North America Inc. www.ato.com | 37 | 160 | 4,000 | Veteran, Focused, Coach, Innovator |
| Robert Schwartz Vice president and general manager | Panasonic USA www.panasonic.com | 25 | 300 | 5,000 | Established, Focused, Adviser, Innovator |
| Ulrich J. Seif CIO | National Semiconductor Corp. www.national.com | 20 | 400 | 11,000 | Established, Dynamic, Adviser, Innovator |
| Peter Solvik CIO | Cisco Systems Inc. www.cisco.com | 20 | 1,800 | 30,000 | Established, Focused, Coach, Maverick |
| Ed Toben CIO | Colgate-Palmolive Co. www.colpal.com | 29 | 900 | 22,000 | Veteran, Focused, Commander, Maverick |
| C. R. (Dick) Townsend Director, information systems | Deere & Co. www.deere.com | 41 | 672 | 100,000 | Veteran, Focused, Coach, Maverick |
| Mining/Agriculture/Construction | | | | | |
| Patrick Thompson CIO | Turner Industries Ltd. www.turner-industries.com | 12 | 29 | 1,000 | Contemporary, Focused, Coach, Innovator |
| Matt Tudor IT manager | Barton Malow Co. www.bmco.com | 15 | 12 | 600 | Contemporary, Focused, Commander, Innovator |
| John Voeller Chief knowledge officer, chief technology officer | Black & Veatch www.bv.com | 27 | 520 | 7,500 | Veteran, Diverse, Coach, Maverick |
| Other | | | | | |
| Gary J. Habermann Director, technical resources | Widener University www.widener.edu | 20 | 22 | 9,000 | Contemporary, Focused, Commander, Maverick |
| John Sheridan Executive director, InfoTest Sector | National Center for Manufacturing Sciences www.ncms.org | 31 | N/A | 50 | Established, Diverse, Adviser, Innovator |
| Jeffrey S. Spar CIO | Reader's Digest Association Inc. www.readersdigest.com | 10 | 375 | 4,000 | Veteran, Diverse, Coach, Innovator |
| Telecommunications | | | | | |
| Chip Ach *** Chief technology officer | HarvardNet Inc. www.harvard.net | 7 | 1 | 200 | Established, Focused, Coach, Innovator |
| Diane Duggan CIO | MCI WorldCom Inc. www.wcom.com | 25 | 9,000 | 70,000 | Established, Focused, Coach, Conservative |
| David Greenblatt Chief operating officer | Net2Phone Inc. www.net2phone.com | 28 | 100 | 400 | Established, Focused, Coach, Maverick |
| John W. Plummer IT division manager | Corning Inc. www.corning.com | 25 | 9 | 250 | Established, Focused, Coach, Innovator |
| Travel and Entertainment | | | | | |
| Michael J. Belak Senior director, data management | Marriott International Inc. www.marriott.com | 19 | 30 | 2,500 | Veteran, Focused, Commander, Innovator |
| John Boushy Senior vice president, brand operations and IT | Harrah's Entertainment Inc. www.harrahs.com | 23 | 250 | 16,000 | Veteran, Diverse, Commander, Innovator |
| Loren W. Brown CIO | Carlson Wagonlit Travel www.carlsontravel.com | 19 | 480 | 20,000 | Established, Focused, Adviser, Innovator |
| Scott Dinsdale Chief technology officer | Firstlook.com Inc. www.firstlook.com | 18 | 20 | 50,000 | Established, Diverse, Commander, Innovator |
| Charles (Charlie) Feld *** CIO | Delta Air Lines Inc. www.delta-air.com | 32 | 2,000 | 72,000 | Veteran, Focused, Commander, Conservative |
| Scott Heintzeman Vice president, knowledge technologies | Carlson Hospitality Worldwide www.carlson.com | 27 | 90 | 1,000 | Established, Focused, Coach, Innovator |
| James E. Lubinski Executive vice president, operations | Galileo International Inc. www.galileo.com | 21 | 1,200 | 167,700 | Established, Diverse, Commander, Innovator |
| Kas Naderi Senior director, emerging technologies | Bass Hotels & Resorts Inc. www.basshotels.com | 17 | 35 | 2,500 | Veteran, Focused, Commander, Maverick |
| Wholesale/Retail Trade | | | | | |
| Ron Griffin CIO | The Home Depot Inc. www.homedepot.com | 24 | 1,000 | 200,000 | Established, Focused, Coach, Innovator |
| Bill Homa CIO | Hannaford Bros. Co. www.hannaford.com | 27 | 155 | 2,000 | Veteran, Focused, Coach, Innovator |



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INSIGHTS

Ann Delligatta (*Autobytel.com*) says her dream job would be managing the California Angels.

7% of the Premier 100 IT Leaders have doctorates.

William S. Wallace (*WingspanBank.com*) says his dream job would be coaching the Boston Bruins.

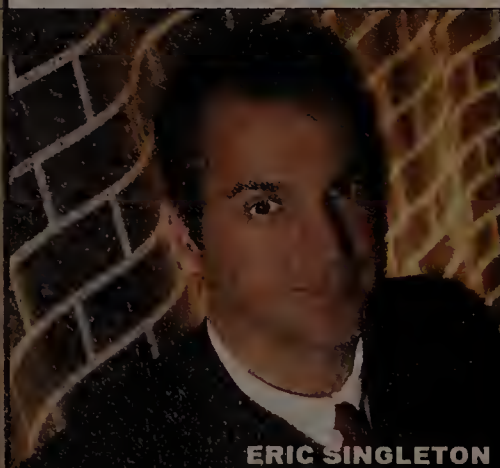
Premier 100 IT Leaders have an **average of 23 years of work experience.**

Scott Heintzeman (*Carlson Hospitality Worldwide*) got his start as a hotel linen runner.

40% of the Premier 100 IT Leaders were previously consultants.

Loren W. Brown (*Carlson Wagonlit Travel*) says his dream job would be building experimental aircraft.

Eric Singleton (*Raytheon*) offers this advice for future IT leaders: "Push the envelope yourself. . . . Get ahead of the trends and changes; make them instead of following them."



ERIC SINGLETON

| TOP 100 | COMPANY (AT TIME OF SURVEY) | WORK EXPERIENCE (YEARS) | TOTAL EMPLOYEES MANAGED | TOTAL USERS SUPPORTED | LEADERSHIP STYLE (KEY) † |
|--|--|-------------------------------|-------------------------------|-----------------------------|--|
| Wholesale/Retail Trade | | | | | |
| John R. Hnanicek CIO | eToys Inc. www.etoys.com | 16 | 120 | 5,000 | Veteran, Diverse, Coach, Maverick |
| Cathy Hotka Vice president, IT | National Retail Federation www.nrf.com | 25 | 1 | 100 | Veteran, Diverse, Coach, Innovator |
| Thomas M. Kasten * Vice president, IS, Levi Strauss Americas | Levi Strauss & Co. www.levi.com | 34 | 332 | 20,000 | Established, Focused, Coach, Maverick |
| Sateesh Lele * CIO | Avon Products Inc. www.avon.com | 30 | 1,600 | 35,000 | Established, Focused, Commander, Conservative |
| Jerry Miller CIO | Sears, Roebuck and Co. www.sears.com | 28 | 1,600 | 340,000 | Veteran, Focused, Coach, Innovator |
| Randall D. (Randy) Mott * CIO | Wal-Mart Stores Inc. www.wal-mart.com | 22 | 1,700 | 1 million | Established, Focused, Coach, Innovator |
| Shailendra (Shelley) Nandkeolyar Vice president, e-commerce division | Williams-Sonoma Inc. www.wsgc.com | 20 | 55 | N/A | Veteran, Diverse, Adviser, Innovator |
| Honorio Padron CIO | CompUSA Inc. www.compusa.com | 30 | 500 | 20,000 | Established, Dynamic, Commander, Innovator |
| John Puckett CIO | Toysmart.com Inc. www.toysmart.com | 30 | 58 | 300 | Veteran, Diverse, Commander, Maverick |
| Robert Rodin President | Avnet Inc. www.avnet.com | 25 | 150 | 2,200 | Veteran, Focused, Commander, Innovator |
| Christopher Smith CIO | Homelife Furniture Corp. www.ehomelife.com | 17 | 15 | 2,000 | Established, Focused, Coach, Innovator |

* No longer at the company

** Retiring at the end of the year

*** Title has changed

N/A=not applicable

METHODOLOGY

How we selected the Premier 100

The Premier 100 IT Leaders project was designed to honor individuals who make a positive impact on their organizations through information technology, mentor and motivate their staffs with interesting challenges and positive work environments, envision innovative solutions to business challenges and effectively manage and execute IT strategies.

LEADERSHIP DEFINED

Our first step was to conduct in-depth interviews with successful CIOs to define the best practices of IT leadership. From those interviews, *Computerworld* editors identified a set of common characteristics of the successful IT leader. We defined an IT leader as someone who does the following:

- Promotes an IT vision that supports the company strategy.
- Understands business needs and budgetary responsibilities beyond the IT department.
- Ties technology and innovation to specific business needs and goals.
- Learns from failure and uses those experiences to improve IT processes and systems.
- Hires people who are inquisitive and innovative.
- Creates work environments that are positive and rewarding to employees, both inside and outside of work.
- Encourages staff to be innovative.
- Motivates with recognition and opportunity, not just money.
- Compares best practices with peer companies.
- Leverages technology vendors as partners.
- Develops leadership skills inside the IT organization.
- Is viewed as a leader by other executives and by the IT staff.

† **KEY LEADERSHIP STYLE:** Years of Experience (Veteran, Established, Contemporary) is based on the IT leader's total years of work experience. Background (Focused, Diverse, Dynamic) is based on the diversity of the organizational areas the IT leader has worked in. Management Style (Coach, Adviser, Commander) is based on the IT leader's management, communication and decision-making preferences. Risk and Innovation (Maverick, Innovator, Conservative) measures the IT leader's tolerance for risk and innovation.

CALL FOR NOMINATIONS

Members of an extensive nominating panel – including business executives, IT leadership development experts, IT recruiters and *Computerworld* editors and writers – nominated individuals who they felt might meet our definition of an IT leader. We received 210 nominations from Oct. 1 through Oct. 31, 1999.

IT LEADERSHIP INDEX

In January and February, the nominated candidates answered a 45-question survey on topics such as their backgrounds and experiences, management styles, the work environments they create, their attitudes toward risk and innovation, their philosophies on technology testing and implementation and the size of their IT organizations.

Using *Computerworld's* IT Leadership Index, which is a measurement of how closely an individual matches our definition of an IT leader, we analyzed the quantitative data. Each of the quantitative criteria was scored separately and given equal weight.

The charts in this special report list the 100 individuals who most closely matched our definition of an IT leader. The honorees are presented here in alphabetical order, by industry.

– Lorraine Cosgrove Ware



DR. SHAHLA BUTLER

IT LEADER

*VP, Director AMS Center for Advanced Technologies,
a job most of us would die for.*

YOU CALL THIS WORK?

**MONTHS BEFORE MOST OF US SEE THE LATEST TECHNOLOGY,
BUTLER GETS A PEEK AT THE REALLY INTERESTING STUFF.**

IT LEADERSHIP is about using every opportunity—every technology—to reinforce your company's purpose. It's about defining business imperatives and driving the acquisition of the right technology. But the daily demands of running a company and an IT infrastructure don't always allow the time to get up to speed on the latest innovations.

As Director of the AMS Center for Advanced Technologies, Dr. Butler's mission is to increase our understanding of emerging technologies. "Ours is a commitment to keeping AMS clients on

the frontier of IT practice," she says. "To address technologies that will fundamentally change the business landscape."

For example, her team's initial XML research yielded an intelligent agent that collects relevant information across multiple sources then synthesizes, categorizes and disseminates it based on a user's specified interests. "Our Next Generation Enterprise and Business Intelligence & Knowledge Management labs are collaborating now to evaluate emerging non-numeric mining

tools," she proudly reports. "We'll be releasing the results soon."

And where does Dr. Butler gain her understanding of emerging technologies? From her peers, at conferences, from the Web and from *Computerworld*. The Newspaper for IT Leaders.

COMPUTERWORLD
THE NEWSPAPER FOR IT LEADERS

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IN SEARCH OF HARMONY

Leaders describe their efforts – some successful, some not – to achieve work/life balance.

"You need to value your personal life over your professional life, then figure out the boundaries. Over the long term, I'm not sure you can have a great professional life without a great personal life."

- Scott Dinsdale
Chief technology officer,
Firstlook.com Inc.

"I'm worthless in that regard. I've been a workaholic since I was 12 years old."

- John Voeller
Chief technology officer, Black & Veatch

"I don't balance work and home. I work too much. I do have a family, but not much of a family life."

- Peter Stern
Chief technology officer, Datek Online
Brokerage Services LLC

"I tend to put my hours in during the week and don't work weekends. . . . Weekends are family time; I try not to touch work then."

- Ron Griffin
CIO, The Home Depot Inc.

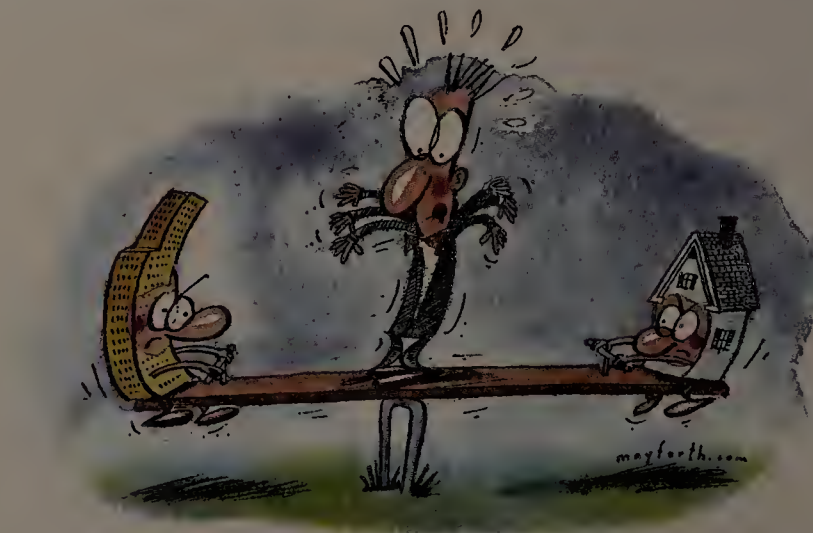
"I get e-mail on my home PCs 24 hours a day, and I respond 24 hours a day. I've blended my family into my work and vice versa [so] that I don't have to draw a line. If I hear the e-mail beep on Saturday and I'm playing with my child, I ask him to wait, respond to the mail, and then I'm back to playing. What you do is part of who you are, and as long as your family understands, there's no issue."

- Manoj Tripathi
CIO, Jamba Juice Co.

"I refuse to work on a computer at home."

- Gregg Farrels
Vice president of IT,
Oceaneering International Inc.

"Two years ago I was . . . taking a lot of work home. Connect at home at night and take care of e-mail. I remember my daughter, just entering her teens, trying to talk to me about nonsense of girls, cliques, boys. I was kind of listening while working, trying to do active



listening that wasn't really active. She told me, 'It's obvious you're not interested in what I tell you, but it's important to me.' She gave me a little spiel, and I realized I really had my priorities screwed up. If I don't listen to her, she'll go somewhere else – and do I want that person giving my daughter advice? So now I do what I can do in my 10 hours at work, and go home to my family. I've always said family comes first, but it's one thing to say it and another thing to put it into practice. She has a soccer game today, and I'm leaving at 4:30."

- Boris R. Bosch
Manager of database administration,
Entergy Services Inc.

"We've come up with a flexible schedule. For 14 days, we put in great effort, then have a three-day weekend every 15 days. And I've learned to come in [to work] earlier or work through lunch to get home at a reasonable hour. I've been able to get my work down to 50 hours a week."

- Patrick Thompson
CIO, Turner Industries Ltd.

"Keep your home life in balance. I see too many people burn out. Hire people smarter than you, and let them run."

- Jerry Miller
CIO, Sears, Roebuck and Co.

"Eighteen months ago, we issued cell phones to the key people, so the cell phone is our lifeline to keep us connected on the run. . . . We can be out playing golf or at a

kid's basketball game and I use the cell phone to deal with things as needed. We have set up the cell phone to read e-mail in speech, and I listen to a half-dozen a day on the phone when driving or other times. If my boss leaves me e-mail at night, I listen to it while driving to work."

- Rick Nolle
Vice president of systems,
Reinsurance Group of America

"I have a very understanding wife of 38 years. She is retired, and she's a seamstress. After spending some time together, I head to [my computer in] the den and she heads to her sewing machine. But I don't believe that if we were raising our children [now], I could have done this [job] and do an adequate job of raising children. This job is not 24 hours a day, but it's not six to eight hours a day, five days a week, either."

- David Cooper
CIO, Lawrence Livermore
National Laboratory

"I rarely stop thinking about things I have to do at Branders.com or where we want to take the company. I was redecorating a bathroom. All of Saturday and Sunday, I was trying to take tiles off, but in the back of my mind I was thinking about the implementation of a financial system and how to integrate better with suppliers. I just don't think that given the fast pace today that you can segment your time that much. You do have to differentiate how you split your time mentally and physically. I can physically split it

well, but mentally, I'm pretty much parallel processing all of the time. I think that's healthy. I don't think there's anything wrong with that."

- John Keast
Now, CIO/chief technology officer,
NetworkOil Inc.

"I confess to being a workaholic. But I have a truly remarkable and supportive family. So I work hard and play hard – that's how I manage. For my family, winding down is taking a really hard 10-mile hike. It brings you closer to nature, to understanding the ethos of life and of what you want to be. And it reminds you that your family is one of the most important resources in your life."

- Sateesh Lele
Former CIO, Avon Products Inc.

"I'm in a demanding position in a demanding company in a demanding marketplace. And I have two children who are 6 and 9. I do my best to keep the family priority high, but there have been more times than I'd like when I'm not home when they go to bed or when they get up. It is one of the toughest challenges in a career where you really love your job. I travel probably 25% of the time, and I work moderately long hours – my average day is 11 hours at the office and another one or two hours late at night. I've made a rule of minimizing my office time on the weekends, but I do tend to work from home."

- Peter Solvik
CIO, Cisco Systems Inc.

"Take vacations where technology doesn't exist. When you go on vacation, don't call into work, because if you haven't built an organization that [can] survive you being gone for two weeks, you probably shouldn't be in the job."

- Jim Donehey
Former CIO, Capital One Financial Corp.

Epilogue: Donehey left Capital One Feb. 29. The company press release said: "Mr. Donehey has decided he wants to spend more time with his family, especially his 86-year-old father, and recognizes that the demands of leading a 1,700-person IT organization do not afford him the time he wants."

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Previo Salutes the Computer World Premier 100 IT Leaders.



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KEEPING WEB DATA PRIVATE

Amid a public outcry that's forcing companies to take action, experts offer their advice on how best to protect the privacy of customer information.

By Ann Harrison



WHEN NEW YORK Internet advertising agency DoubleClick Inc. revealed in January that it planned to merge a database containing the names, addresses and off-line buying habits of millions of consumers with Web usage information gathered by its cookies, it learned the consequences of having an invasive privacy policy.

The plan prompted an e-mail campaign against the company and its clients by the Washington-based Center for Democracy and Technology that

charged the policy would provide too much access to unsuspecting users' personal information. The controversy sent DoubleClick's stock plummeting and ignited probes by the Federal Trade Commission (FTC) and several states.

Stung by the backlash, DoubleClick announced in March that it would postpone the proposed changes. But it wasn't the first company to be slammed for potential privacy violations. RealNetworks Inc. was pressured to redesign its music software when it was revealed that its RealJukebox player monitored users' listening activities and sent the data back to

the company. And a boycott was organized against Intel Corp. when it announced plans to include unique identification numbers in its Pentium III chips.

Gary Laden, director of the Better Business Bureau Online (BBBOnline) program, which has guidelines governing the use of data collected or displayed on Web sites, says the most common problem that arises during audits is that most corporate privacy notices don't contain enough information on how personal data will be used. He says notices are also difficult to find, and many sites are uncertain about how to provide the right users access to their personal information.

"Before consumers give out any information, they should have an easy way to see where it will be used," says Laden. "Any collection of sensitive information, including credit cards, financial data or Social Security numbers, needs to be encrypted."

Easy Access to Policies

Laden says companies should make sure there's a link to privacy notices on the location where information is being collected or one link away from the site.

Alan Zausner, director of external Internet standards at American Express Co. in New York, says companies developing privacy policies stay ahead of the curve by conducting due diligence of privacy issues before launching new products.

Companies should also make sure that different groups of managers understand how their product or service could impact user privacy, says Zausner. At Amex, he says, it was essential for the vice president of consumer affairs and the head of privacy data and security to understand the technology the company uses and for technology managers to appreciate privacy concerns.

As a brick-and-mortar financial services firm, Zausner notes, American Express has had to follow privacy rules for years, giving executives a higher sensitivity to emerging online privacy issues.

"One will truly have to understand what the technology is doing to fulfill what the privacy promises are," says Zausner. "You have to let IT know that the code will translate into legislative or regulatory requirements and [impact] the integrity and protection of your brand and the customer's impression that you are truly the guardian of their privacy."

David Steer, a spokesman for San Jose-based Truste, which also develops guidelines on Web data use, suggests that companies start developing privacy policies by assessing what information their departments gather and make sure company executives have a

MOREONLINE

Want to know more about online privacy? Here are a few key Web sites:

- **The Better Business Bureau Online Privacy Policy** (www.bbb.com)
- **Truste** (www.truste.org/users/users_watchdog.html, www.truste.org/users/users_privacy_links.html)
- **Center for Democracy and Technology** (www.cdt.org/privacy/survey/findings/surveyframe.html)
- **Electronic Frontier Foundation** (www.eff.org)
- **EPIC, or Electronic Privacy Information Center** (www.epic.org)

mandate to address the issue. Instead of trying to centralize privacy policies in one department, smart corporate privacy officers develop companywide approaches. Steer says the best privacy policies let consumers "opt in," actively choosing to receive information.

According to Steer, Electronic Data Systems Corp. in Plano, Texas, has one of the best-followed practices: Every public privacy discussion by an executive is posted on the company's intranet to educate employees.

Bill Poulous, EDS's director of e-commerce policy, says companies must tell consumers they're collecting personal information, let them know what will be done with it and give them an opportunity to opt out, or block collection of their data.

If customers agree to have their data collected, Poulous adds, they will want

JUST THE FACTS

A survey released last month by San Diego-based Enonymous.com found that 77% of the busiest Web sites have no stated privacy policies. But that's an improvement over a 1998 FTC report, which indicated that 98% had none.

to know if it's accurate and secured and how long it will be stored. Companies should also disclose whether people have the right to access information to determine whether it's timely and accurate, he says. In addition to notifying customers about data collection and use, he says, EDS

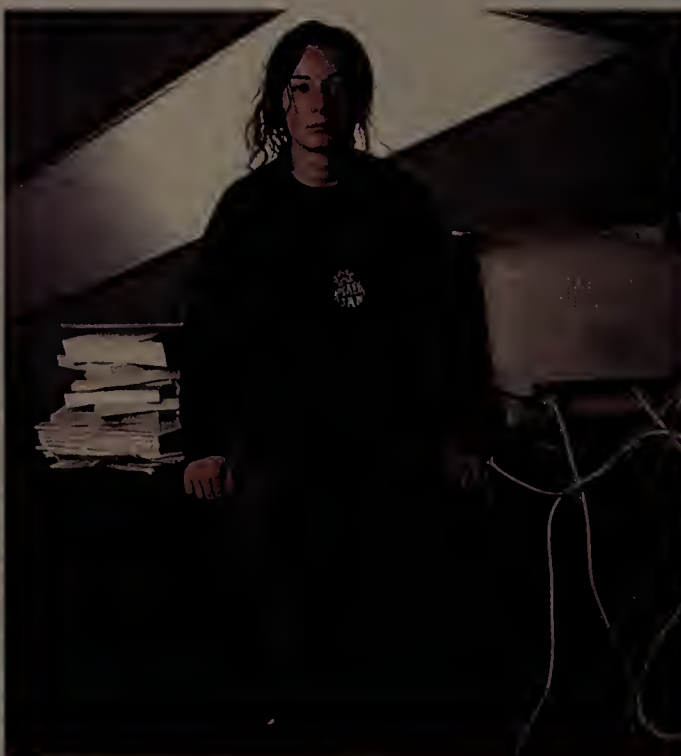
tells them whom to contact to check the data's accuracy.

Poulous says consumers should also be aware that privacy policies can be enforced. By displaying the Truste seal, Poulous says, EDS agrees to let Truste review its privacy policies for compliance and take the seal away if the policies don't meet standards. He says companies should focus on "posting privacy policies in clear language that the average citizen can understand and then doing what they say they do."

Some privacy activists argue that groups such as BBBOnline and Truste, which support self-regulation, don't have the power to effectively enforce their guidelines. They argue that legislation is both needed and inevitable.

But in the meantime, Orson Swindle, a member of the FTC, urges Internet companies to review their privacy policies and do a better job of securing data. "It's going to be your way or the government's way," he says. "Your choice." ▀

The New Dress for Success



Scott Barnett and Sabrina Hague, both graphic designers at Web start-up Umagic Systems Inc. in New York, were guilty of many of the "don'ts" of acceptable corporate attire, prior to being made over by the staff of CandoWoman

BY JULIA KING

LOOKING TO LAND A PLUM spot on your company's new e-commerce project team? Here's some advice: Ditch the white dress shirt and Brooks Brothers tie. Show up for work in a pair of khakis and a collared polo shirt instead.

Or maybe you're bucking for your boss's job. If so, save that golf shirt with the Microsoft logo and that SAP tote bag — both freebies from user conferences — for weekend trips to the beach.

And forget the red, white and blue Tommy Hilfiger gear and Ralph Lauren shirts with the little horses on them.

"It's best not to align yourself with anything, especially if you're trying to move up the corporate ladder," explains Barbara Seymour, a Los Angeles-based lifestyle and wardrobe consultant who doubles as the fashion police on www.careerpath.com, a popular Web site for information technology professionals.

As for the khakis and polo shirt, Seymour says that dressing casually "sends a nonverbal message to co-workers that you're a team player."

A casual dress policy also plays a

So, What Shall I Wear?

Confused? Check out the experts' list of business attire do's and don'ts, whether you work at the most buttoned-down bank or an anything-goes Web start-up.

Do:

- Choose microfiber fabrics. They don't wrinkle like cottons and linens.
- Choose clothing with simple, clean lines. It's more comfortable and isn't distracting to co-workers.
- Keep your weekend wear for the weekends. Anything that even remotely resembles something you'd wear to a club or the beach should stay in your closet during the week.

Don't:

- Wear sneakers or any other athletic gear on the job — even on dress-down days.
- Go overboard with the scarves, bracelets, belts or hair barrettes. Less is more when it comes to accessories.
- Let it all hang out and expose your personal assets. Keep your navel piercings to yourself.
- Make the biggest mistake, which is believing that what you wear to work doesn't matter. It does matter — always — and "you don't ever have a second chance to make a first impression," says Katlean deMonchy, a fashion expert at CandoWoman. — Julia King

“

Casual is supposed to mean you're more comfortable. But that doesn't mean coming to work looking like you just came from your dorm room.

KATLEAN DEMONCHY, FASHION EXPERT,
CANDOWOMAN

major role in how potential employees view a company, according to an online survey conducted by Netherlands-based accounting and consulting giant KPMG International. The survey found that 76% of students are more likely to accept a job offer from a company that has a casual dress policy.

But beware: Crossing the line from business casual to business casualty is easier than you think — especially in high-tech circles.

Aiding the Fashion-Challenged

“Casual is supposed to mean you're more comfortable. But that doesn't mean coming to work looking like you just came from your dorm room,” says Katlean deMonchy, a fashion expert at New York-based CandoWoman, whose client list includes several Internet start-ups.

“I don't think all technology people are fashion-challenged, but it seems to be the cool thing to act like you don't care at all,” deMonchy says. “It's gotten to the point where it's not one earring but 12. And all-over-the-body tattoos. I'm all for self-expression, but in the workplace, it can get distracting.”

So, what should you wear to work these days?

Sid Nashburn, vice president of design at Dodgeville, Wis.-based Lands' End Inc., which recently devoted an entire catalog to business-casual clothing, recommends that men and women build their work wardrobes around a handful of key, cornerstone items.

For men, they include a navy blazer, a pair of charcoal-gray or heather trousers, a pair of khaki chinos, a few oxford shirts and a few polo shirts.

And forget beige and hunter green.

“We've had way too many earth tones — khakis, browns and olives,” says Nashburn. “This spring and summer, there's a lot more color.”

The same advice goes for women. Specifically, look for citrus colors and various shades of blue and fuschia,



Freshly made-over, Sabrina is wearing office attire that features clean, simple lines and light colors. In these photographs, she shows how a few basic clothing items can be mixed and matched to create a variety of looks, all of which are casual but still professional-looking



New shirt, new slacks, new haircut – it's a whole new image for Scott. His made-over appearance is appropriate for a professional on the move, and he's still able to include casual, comfortable items in his new wardrobe

“

I don't think all technology people are fashion-challenged, but it seems to be the cool thing to act like you don't care at all.

KATLEAN DEMONCHY, FASHION EXPERT,
CANDOWOMAN



which every woman should make a point to work into her wardrobe, even if it's only a dash, consultants advise.

“If you have just a little flash, it shows you're paying attention to trends,” which is critical in today's fast-paced business environment, Seymour says.

Common-sense Casual

As for women's cornerstone wardrobe pieces, Seymour recommends a sweater set; a white cotton blouse; a simple black dress, which can be sleeveless; a “nice pair of slacks — nothing too tight”; and a neutral-color skirt, which should be no more than 2 inches above or below the knee.

“None of this is brain surgery. It's common sense. But still, dressing casually is totally confusing” to most IT professionals, Seymour says.

DeMonchy agrees. “With the coming-of-age of the casual work style, people are hard-pressed for the 411 on correct casual vs. seriously sloppy,” she says.

Nashburn says this is especially true for men, whose most common gaffe is “dressing too casually and underestimating the power of their appearance.”

Styling Credits

Sabrina

Look #1:

Pants and blazer:
Lands' End.
Pink shell and pink
blouse: Liz Claiborne.
Shoes: Nine West.
Necklace: Model's own

Look #2:

Skirt and jacket:
Banana Republic.
Lemon shell: The Gap.
Shoes: Nine West.
Necklace: Model's own.

Scott

Look #1:

Purple shirt and
linen pants: Banana
Republic.
Mauve striped oxford
shirt: Lands' End.

Look #2:

Black chino pants:
Banana Republic.
Shoes and socks:
Lands' End.

Hair and makeup: Janet Waddell, Vidal
Sassoon, New York

Stylist: Katlean deMonchy, CandoWoman,
New York



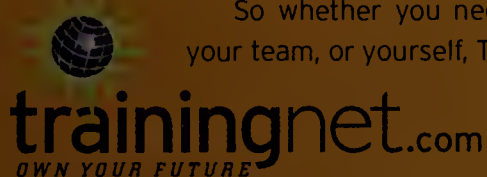
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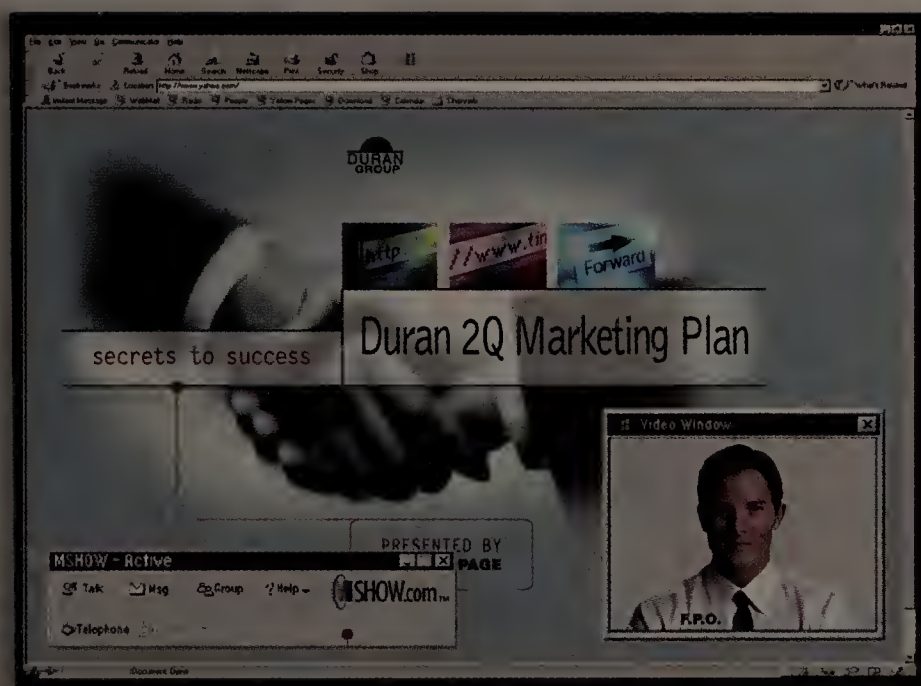
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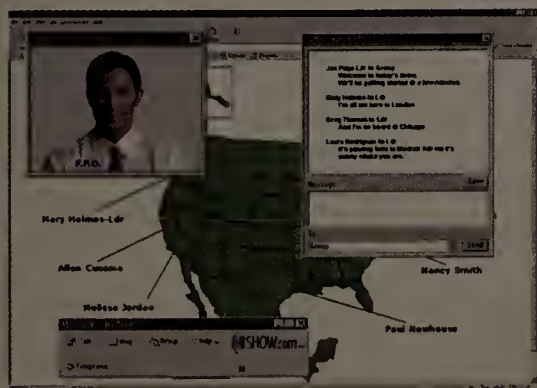


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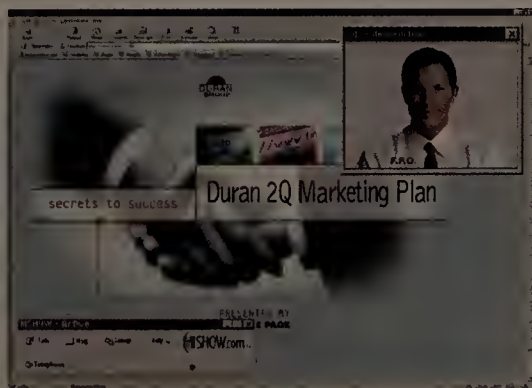


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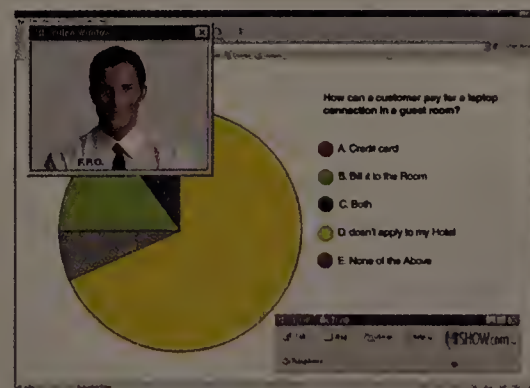
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Real-Time Reporting

BY MARIA TROMBLY

IT WASN'T TOO long ago that corporate accountants could take their time assembling, analyzing and packaging financial data for executives. It took a while to massage the numbers, and that wasn't a problem because the competition was moving at the same sluggish pace.

But in the past few years, as e-commerce has sent business time lines into warp speed, annual budget cycles and monthly financial reports have proved to be inadequate tools for managing the rapid pace of change at many companies. To keep up, many have adopted real-time reporting.

Spending on real-time reporting reached \$1.05 billion 1998, according to International Data Corp. By 2003, the total is expected to exceed \$4.1 billion, says IDC analyst Henry Miller, explaining that this figure includes worldwide spending on end-user query and reporting software.

A major part of the increase is due to the fact that e-commerce makes it possible to gather more data significantly faster than before.

At the same time, production cycles are shorter and the pace of innovation has accelerated. But traditional financial managing and reporting systems weren't created to deal with such a fast pace.

"Budgets tend to be retrospective," says Randall Russell, director of research at the Balanced Scorecard Collaborative Inc. in Lincoln, Mass. "They

DEFINITION

Real-time reporting makes financial and other company data available on demand rather than on regularly scheduled annual, quarterly or monthly cycles. Management can then respond more quickly to problems or opportunities that arise.

give you a view of what happened last time but don't tell you what the drivers are for next year."

A senior manager should be focused on strategy rather than the annual budget, Russell added. "An annual budget cycle is woefully inadequate for today's competitive environment," he says. "If you look at the market — look at competitive dynamics — it's a recipe for disaster."

A New Economy Company

In September 1995, The Dow Chemical Co. in Midland, Mich., started planning its real-time reporting system. It went live in January 1997 and received national recognition for its innovative and effective methods.

Today, all the information the company tracks is done by an automated, paperless system, according to Mike Costa, Dow's director of finance.

"We opted to create a global data warehouse and a series of data marts," he explains. "Then

we deployed some enterprise software — specifically Business Objects and Power Play. So we went from a batch mode with paper reports to pretty close to real time."

Real-time reporting allowed Dow to retire about 1,300 legacy logistics and manufacturing systems and made it possible to get reports to management instantly, says Costa.

At Dow, 30 data marts — or mini-data-warehouses [Technology QuickStudy, Dec. 12] — cover areas such as maintenance, logistics, inventory management, sales management, production, expense reporting, capital spending, fixed-asset monitoring and personnel data.

This data is constantly made available to about one-third of the company's 39,000 employees, Costa says.

"It starts with senior management and goes right on down to the people who are doing day-to-day operations," he says.

A handful of standard re-

ports are available, but most users build their own reports out of whatever subset of the warehoused data they need.

"They're easy to do," Costa says. "So the big savings is instead of trying to design hundreds of reports for people, you empower them to get what they need."

Keeping Pace

Research from Balanced Scorecard shows that nine out of 10 companies fail to execute the strategies they set for themselves, that only 5% of employees understand company strategies, that 60% of companies fail to link their budget to their strategies and that 85% of companies' executive teams spend less than one hour per month discussing strategy.

Russell suggests companies keep an eye not only on income and expenses but also on such areas as customer satisfaction, internal processes and employee growth and learning.

Companies can determine which reporting cycles work best for them by looking at how decisions need to be made.

For example, decisions pertaining to pricing, including raw material costs or competitors' price cuts, require up-to-the-minute data. But decisions regarding fixed assets can wait longer.

The process turns conventional financial reporting thinking on its head, says Jon Scheumann, a consultant at Boston-based Gunn Partners Inc., who helps companies make the transition to real-time reporting.

"It's almost like reverse logic. You have to think backward from decision to information then to the cycle times," says Scheumann.

Once the critical data is identified, it can be collected in a central data warehouse and made available to everyone who needs it.

According to Scheumann, automation usually pays for itself in 18 to 24 months or less.

He warns, however, that the savings aren't always obvious.



Instead of trying to design hundreds of reports for people, you empower them to get what they need.

MIKE COSTA,
DOW CHEMICAL

"What you're doing is looking at making investments to have a positive impact on the performance of the business," says Scheumann. "That could show up in increased market share or increased profit margin — you have to be insightful and creative as to how you look at cost benefits."

Automation price tags could run to the millions of dollars for companies that start from scratch, says Neil Lazar, a director at AnswerThink Consulting Group Inc. in Hudson, Ohio. But the costs can be much less for companies that already have enterprise resource planning systems and a fair amount of integration between operational and finance systems.

However, if a company wants to do real-time reporting manually, it should rethink what reports are needed, says Lazar. (See story at left.)

"You want to do as little of it as possible because it's very time consuming and very labor intensive," he says. ▀

Is This Report Really Necessary?

Many companies have more reports than they really need, according to Neil Lazar at AnswerThink Consulting Group. He says the following questions can help companies determine what system works best for them:

Is there overlap with other reports? Many standard reports produced by enterprise resource planning systems are very duplicative.

What information do managers need to run the business effectively? That's typically much less than the universe of reports that are available. You have to decide what the key metrics and the key drivers are for your business. You don't need hundreds of reports to let you know how you're doing on a day-to-day or real-time basis.

Will you take immediate action

based on the report? Why produce it on a regular basis if you're not going to take immediate action?

Is the report needed only in certain circumstances? Reports can be set up to be produced only if certain tolerances are exceeded. It's like the oil light in the car: The system monitors your oil all the time, but the light only goes on is when you need to act. — Maria Trombly



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Dear Career Adviser:

I'm currently a Visual FoxPro contractor with eight years of experience in Visual Basic and Delphi but apparently not enough experience to get me out of FoxPro. Recruiters always push me toward FoxPro instead of looking for even a lower-level Visual Basic contract.

I'm afraid the demand for FoxPro is drying up quickly. I'm having trouble getting my foot in the door for Visual Basic or Active Server Pages (ASP) projects and wonder if "at-home" projects count as verifiable experience.

— FORMER FOX

Dear Former:

According to James Cowan, a Web developer at ComputerJobs.com Inc. in Atlanta, it's true that FoxPro is more of an industrial-strength relational database development system when compared with Microsoft Corp.'s Access.

Despite its limitations, FoxPro supports modern technologies such as Component Object Model and ActiveX. It also can be an excellent front-end development system in both two-tier and three-tier application development environments.

But bottom-line, it has never caught on as well as other

development tools. Now, in part because of the FoxPro programmer shortage, it seems to be on the "outdated" technology track.

There is good news, however. The object-oriented coding practices in Visual FoxPro are similar to Visual Basic and ASP. And SQL Server and Access require the same database design and management skills that FoxPro requires. So your transition is possible.

To reach your goal, focus on companies migrating from FoxPro to Visual Basic and emphasize that you only want to do Visual Basic work.

Tim Cederquist, vice of product development and technology at ComputerJobs.com, confirms that in this tight job market, your initiatives with home hobby projects and classroom training do help if you don't have on-the-job access to the technology. Cederquist also suggests looking online for free

entry-level and demonstration versions of products to gain greater expertise.

Finally, your quest to make this next move might meet with greater success at younger companies in rapid-growth mode seeking talent on smaller budgets.

Dear Career Adviser:

Should I use a recruiter who will charge me between \$2,300 and \$4,500 to help me find a new job rather than someone who charges the employer a commission? — MONEY TALKS

Dear Money:

Absolutely not. At best, you're dealing with a "motivational counselor" who isn't a recruiter at all.

Similarly, delete résumé-blasting services from your job-search efforts, since such e-mails are usually left unread and then deleted by recruiters.

Take courses leading to solid technical credentials and pay for career counseling through a local college or university career center. This will help you most.

Dear Career Adviser:

I have a bachelor's degree in computer engineering and have been in the information technology industry for two years. I have a job offer from a consulting firm's electronic integration group and another from a promising e-commerce Internet start-up. What is the best choice? How can I make this decision?

—BEST CHOICE

Dear Best:

"If you're really going to be an e-commerce guru, you'll need a language-based, object-oriented background that includes Java and [Enterprise JavaBeans], plus a whole raft of middleware fluencies involving C++ or XML and a strong [graphical user interface] tool set to provide the basis for the graphics, flash and splash," says Pat Greenwood, managing director at Detroit Office Decision Consultants Inc., which has an e-commerce practice.

But deciding between a company or a consulting firm or between being a developer vs. being a consultant really revolves around how you want to apply and grow your skills, your personality and your tolerance for the workload at a start-up.

At an e-commerce software developer, with your experience, you're likely to be flying by the seat of your pants as a programmer and you'll be highly accountable. With this same level of experience in a systems integration/consulting environment, you could be a team leader — but not a

project head until you've been through more wars.

Katy Keim, vice president of development at IntraWare Inc. in Orinda, Calif., suggests the consulting group will be more structured and have career paths, great mentors and development plans.

By contrast, the Internet start-up could be more unpredictable — both in its dynamic change and number of opportunities.

Both are good choices.

Remember, career growth means going where you will most likely stay at the top of your technical game. ▀



FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

BRIEFS

GM Heads West

Detroit-based General Motors Corp. plans to open an office for its e-GM unit near Silicon Valley. The automaker leased 55,000 square feet of office space in San Francisco for the business unit, which was launched in September to focus on Internet services such as GM's On-Star in-vehicle Web access technology. E-GM headquarters will remain in Detroit, but the automaker hopes to have at least 50 employees in the new office by year's end.

New CFO at McData

McData Corp. last week appointed Eric Pillmore as its chief financial

officer and vice president of finance and administration. Before joining the Broomfield, Colo.-based enterprise Fibre Channel company, Pillmore served as senior vice president of finance and CFO at General Instruments International Inc.

NBC4 Names IT Chief

NBC4 in Los Angeles recently named Grant Morrow director of new media and information technology. He is responsible for NBC4's Web site content sales and offerings as well as overseeing the operations of the station's IT department.

Self-Made Women

Almost half of all women surveyed by San Francisco-based Girl Geeks Inc. said they learned their IT skills

on the job or were self-taught, compared with almost 22% who studied IT in college or vocational schools. Girl Geeks found that survey respondents in the under-30 crowd were more likely to fall into the former category than those over 30, who learned IT in school.

Rural Net Access Lags

A U.S. Department of Commerce report shows that network bandwidth has increased in cities but not in rural areas. Cable modems are available in more than 65% of cities with populations exceeding 250,000, and telephone-based Digital Subscriber Line networks are available in 56% of towns with populations of more than 10,000, the report said. Less than 5% of towns with fewer than 10,000 people have access to either technology.

SNAPSHOT

Hot Jobs in IT

Internet and intranet developers are in demand. The job category has replaced networking as the most sought-after skill in information technology, according to Menlo Park, Calif.-based RHI Consulting Inc.'s seminar "Hot Jobs in IT." RHI's survey of more than 1,400 CIOs nationwide showed that the following job categories experienced the strongest growth in the U.S.

| | |
|-------------------------------|-----|
| Internet/intranet development | 23% |
| Networking | 21% |
| Help desk/end-user support | 14% |
| Applications development | 9% |
| Operations | 8% |
| Project management | 6% |
| Systems analysis | 4% |
| Other/don't know | 15% |



E-BIZ HAS A NEW A-TEAM.

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CAMERA READY

Palm and Kodak have teamed up to create the PalmPix, which turns the Palm handheld device into a digital camera. It's nice and small, weighing only 1.5 oz. without its batteries. **70**

WHISTLER UPDATE

Every year at the WinHEC conference, Microsoft opens its cloak of secrecy a little bit for hardware developers. Take a peek with us at Whistler, the operating system that's supposed to replace Windows 2000 next year. **70**

IN SEARCH OF BANDWIDTH

Network managers at Network/Interop this week will be looking for ways to meet the demand for bandwidth that's been brought on by the surge in electronic business. **72**

HACK OF THE MONTH

As hardware giants like IBM, Compaq and Dell put the final touches on their support for Linux, vulnerabilities of the open-source operating system are piling up. **73**

SECURITY JOURNAL

When he's not lounging by the pool doing remote network administration with his cellular-capable notebook, Pat soaks up some neat tips about security threats against TCP/IP and domain controllers. **74**

EXEC TECH

Always a poor relation to the huge fall Comdex show, Comdex/Spring has been getting smaller as an increasing number of vendors are opting to stay away. But reviews editor Russell Kay did manage to find a few notable items. **76**

QUICKSTUDY

Imagine having a telephone but no Yellow Pages, White Pages or directory assistance. That's the Web without search engines. We offer a primer on different search engines and how they work to help users navigate the Web. **78**

SURVEY SAYS...

A recent *Computerworld* survey suggests that the retail e-commerce efforts of many companies, are relatively small and not technically complex. Nonetheless, they face the same technical bottlenecks as much larger systems. **80**

EMERGING COMPANIES

CrossCommerce helps firms that operate content and community Web sites sell products and relieves them of the cost and hassle of maintaining an e-commerce infrastructure. **86**

JOB WATCH

Scott Banister explains how he turned an active imagination into a lucrative career as an e-commerce strategist who has attracted the attention of Microsoft and others. **92**



MARCUS RANUM, CEO of Network Flight Recorder, says his company used open-source code to create its software, but he doesn't want users to tamper with the software once they've bought it

AN OPEN-SOURCE UNDERGROUND

MANY IT MANAGERS from traditional backgrounds may recoil in horror at the thought of open-source operating systems. But some programmers love these systems and spirit them into their non-open-source shops to get particular IT jobs done — a practice that often leads to maintenance and support headaches.

82

Kodak Puts Digital Photos In the Palm of Your Hand

New device from photography giant turns the Palm PDA into a digital camera

BY MATHEW SCHWARTZ

PALM USERS have had access to a variety of accessories: folding keyboards, wireless modems, backup modules. But the new PalmPix camera from Rochester, N.Y.-based Eastman Kodak Co. brings something new to the mix: It turns the Palm into a digital camera.

Although I'm not usually a fan of devices that try to do everything, the PalmPix elegantly uses Santa Clara, Calif.-based Palm Inc.'s handheld for image preview, storage and picture taking, and it's nice and small, weighing only 1.5 oz. without its two AAA batteries.

Here's how the PalmPix works: You attach it to a Palm III or VII HotSync port — the V series requires a \$35 adapter — and start its Palm software. From the main screen, you can name images you've taken, choose full or half-resolution or trigger the self-timer. It also lists how many images you can take given available memory.

Like most cameras, this one is built for right-handed users. You hold the Palm screen toward you; the camera faces away. A rubber ridge on the camera exterior makes it easy to position your hands. With your right thumb, you tap the Datebook button on the lower-right side of the Palm to start the preview — which produces a very low-resolution live grayscale (even with color models) preview window on the Palm. Because the resolution is so poor, it's good only for checking composition, not seeing whether eyes are open or smiles are right. You press the Up button to trigger the digital zoom, which can magnify the image by a factor of two. Then press the Datebook button again to take the picture.

The PalmPix module transfers the image to the Palm. The transfer takes about two sec-

onds for zoomed images because they use less of the charge-coupled device. For normal images, the transfer takes about 10 sec. Once the images are on the Palm, you can view them on the device's screen, though the Palm's 160- by 160-pixel resolution doesn't do them justice. You can also title or delete images on the Palm.

Transferring images from camera to PC is easy: You just hotsync the Palm as you normally would. Image processing — from interpolation on up — is handled during the hotsync. This is an elegant system that, according to Kodak, uses one-third less processing power,

not to mention less time, than it would take on a Palm.

Once transferred to the PC, all images are in color, and you can free up Palm memory again. And the image quality, even when using the zoom, is good. At full 640- by 480-pixel resolution, the images won't make great printouts but are fine for posting to the Web or sending via e-mail. With today's 8MB Palms, you can store about 30 high-resolution PalmPix images before needing to hotsync.

There are, however, several downsides to the camera. For one, there's no lens cap. Given the state of plastics today, there's just no excuse for that. Also, there's no flash, so you're relegated to outdoor shooting or holding it very, very still indoors. (Its

shutter speed slows down to 1/15 sec.) A spokesman for Kodak said the lens cap and case were omitted for simplicity's sake, to keep the cost down and because they may not be necessary, given the way people will carry the camera —

you don't wear it around your neck. Kodak, of course, sells accessory cases. The PalmPix camera retails for \$179.

Since image-preview quality is so low in general on Palm computers, I wouldn't recommend this camera to two large, professional populations of digital camera users: real estate agents and insurance adjusters. Until the image gets to the PC, it's hard to tell if it has come out properly. But for Palm fanatics wanting an inexpensive, Web-quality camera, it's a handy little gadget. ■



KODAK'S PALMPIX attaches to a Palm PDA HotSync port, creating a handy, inexpensive digital camera

Analysis: Life After Win 2k

Gates has no new answers at WinHEC

BY RUSSELL KAY
NEW ORLEANS

The Windows Hardware Engineering Conference (WinHEC) is Microsoft Corp.'s annual bash for hardware makers. There, it talks about what's coming up and how developers can design new hardware to take advantage of new capabilities. It's one of the best places to learn about Microsoft's future directions for Windows.

Last year, the buzz was the upcoming Windows 2000 family. This year, Microsoft revealed its strategy for the operating system that will follow Win 2k in 2001 — a product code-named Whistler.

Bill Gates said Whistler will be a general-purpose operating system family aimed at business (as is Win 2k) but also suitable for individuals. He also discussed the forthcoming Windows Millennium Edition (Windows Me), the consumer

operating system at the end of the development line for the Windows 95/98 family.

Goals for Windows Me and Whistler are faster boot-up, compatibility with Universal Plug and Play, enhanced stability and reliability, and far simpler usability and installation.

These operating systems are being designed for ever-greater emphasis on multimedia and digital content delivery. Here's what's in store:

- Digital audio and video, with audio used in multiple, interactive ways.
- Simpler connectivity, with Bluetooth wireless networking replacing many cables.
- More integration of digital images and Web publishing.
- Abandonment of legacy systems and peripherals.
- Reliance on better connections such as Universal Serial Bus and IEEE-1394 serial bus.
- Self-repairing systems that protect themselves against applications that install unapproved system files.
- Automated downloading of operating system updates —

but without automatic installation.

■ Always-on, broadband Internet access as the primary source of content of all types.

Carl Stork, general manager of Microsoft's Windows hardware strategy group, laid out plans for Windows development in the next two years.

He said the number of transactions will soar, "and any transaction not handled well is lost business." However, "[our] ability to predict transaction load accurately will decline." What's needed, said Stork, is the capability to add capacity quickly, without interruption.

The main goals are reliability and scalability, and Microsoft is attacking these issues from many angles.

Scalability — the ability to increase or decrease processing capability to handle changing workloads — can be accomplished in different ways.

One, which Microsoft calls "scaling up," means going for a bigger computer — more processors, more memory and eventually a 64-bit architecture. With this approach, the software operating environment doesn't change as it scales up. But making changes can inter-

rupt normal operations.

Another option, called "scaling out," involves adding servers — often dedicated to one or two functions — or server clusters. With the right tools, the system can be managed as if it were a single machine.

This means less-expensive expansion without interruption. A key element in this approach will be a new product, AppCenter Server, that targets reliability and scalability. It will enable application replication, load balancing and monitoring of performance and health.

Except for some details, Microsoft's story this year was almost the same as last year: Computers are too hard to use; they need to be better, faster, more robust, more secure and more scalable. Last year, the answer was Win 2k. Now Microsoft tells us the "Next Big Windows" will do a better job.

One question remains for information technology managers: Do I migrate my (clients/servers) from (Windows 9x/WinNT/Unix) to a newer Windows version? The answer is important for IT, and it's critical for Microsoft. But right now, Gates and company are Whistling in the dark. ■

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Networld Focus Is Bandwidth

BY JAMES COPE

Network managers gathering at the Networld/Interop 2000 expo in Las Ve-

gas this week will be looking for ways to meet the bandwidth demand brought on by the surge in e-commerce, as ven-

Just a reminder
that when it comes to B2C apps,
it's the software, baby.

The majority
of the top
100 Media Metrix
shopping sites
are built on
the Microsoft®
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development
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dors promise smarter and faster switching and more reliable routing.

Steve Brown, director of network services at Providian Financial Corp. in San Francisco, said he's interested in intelligent call routing using voice over IP to ensure that customers are routed to the right person in Providian's call centers. Voice over IP allows voice traffic to be sent over IP networks designed to carry data.

"We've been talking to Cisco about their IP phone products," Brown said. "It looks like convergence [of voice and data] is getting off the pages of the newspaper and into the enterprise."

San Jose-based Cisco Systems Inc. plans to demonstrate its Avid voice over IP telephone system at the show. And Murray Hill, N.J.-based Lucent Technologies Inc. will be there with what one observer described as a "cool e-biz demo" that simulates a working customer service center.

But convergence, and even more network traffic, brings new challenges in network load management and content prioritization. Quality-of-service capability is one possible answer because it allows network managers to steer the most important data along the least crowded data paths.

Analyst Stan Schatt at Giga Information Group Inc. in Cambridge, Mass., said a new breed of quality-of-service programmable network appliances (single-purpose computers) are coming to the rescue. And although Cisco and others will likely promote similar technologies, Schatt noted that the newest such devices will come from Sitera Inc. in Longmont, Colo., and LightSpeed Semiconductor Corp. in Sunnyvale, Calif.

Schatt said Gigabit Ethernet over metropolitan-area networks (MAN) would also be a big topic. Santa Clara, Calif.-based Extreme Networks Inc. will show its new Alpine line of carrier-class switches that use optical Gigabit

AT A GLANCE

Hot Topics

Networld/Interop, May 7 to 12,
Las Vegas Hilton Convention Center

FOCUS: Technologies that enable e-commerce

■ Network acceleration based on programmable network processor chips

■ Convergence of voice, data and video

■ Gigabit Ethernet, including deployment over metropolitan area networks

■ Outsourcing of in-house networks

■ Telephone carriers repositioning themselves as data service providers and systems integrators

■ Optical networking

Ethernet to connect buildings in campus or urban settings. Using Ethernet, the transport standard for most corporate LANs, the switches will make connections to the MAN seamless. A fully equipped Extreme Alpine 3808 switch for 4G bit/sec. fiber optic ports and 32 Ethernet ports costs more than \$30,000.

Attendees will also be able talk to communications service providers. Cincinnati-based Broadwing Inc. said it would present its virtual private network services as well as plans for eight new data centers. Global Crossing Ltd., a Hamilton, Bermuda-based worldwide Internet backbone provider, said it would highlight its business video- and audioconferencing services.

Telecommunications carriers will have a sizable presence, according to Networld/Interop Vice President and General Manager Valerie Williamson. Sprint Corp. said it would announce unspecified enhancements to ION, its all-in-one system aimed at allowing businesses to integrate voice, video and data over a single network. On the heels of its recent partnering announcement with Cisco, SBC Communications Inc. in San Antonio said it would detail its systems integrator services. ▀

BRIEFS

OpenReach to Launch Net Management Service

OpenReach Inc. this summer will offer a remote network management service to give small and midsize companies easier access to broadband IP networks. Customers can download a 1.4M bit application that provides routing, a firewall and virtual private networking. On the back end, OpenReach serves as a certificate authority and runs a network operations center, data center and call center to help fix access problems. Pricing ranges from \$99 per month for 500K bit/sec. access to \$499 per month for 8M bit/sec. access. www.openreach.com

'Web Box' Testing Tool

With the latest edition of its testing tool for Web sites, WebKing 2.0, ParaSoft Corp. in Monrovia, Calif., addresses a prevalent problem in Web application development.

Existing tools can perform two types of tests: "white box" tests, in which an application's construction is examined for correctness, and "black box" tests for determining whether an application performs the functions it's supposed to.

To this mix, ParaSoft adds what it calls "Web box" testing, which is specifically designed to test one dynamic page at a time to ensure that dynamic output is produced and displayed correctly.

WebKing SiteRuler is available for Linux, Solaris and Windows 9x, NT and 2000. www.parasoft.com

DEBORAH RADCLIFF/HACK OF THE MONTH

Open (source) sesame

BEFORE LINUX CAUGHT ANY INK in the trade journals, hackers had been using this open-source operating system to wage war on other hackers. The key to the game is to harden your operating systems against attack while finding ways to break into your opponents' Linux machines and gain access to the root directory, from which you can wreak havoc on the rest of the system.

Now that hackers and crackers are intimately familiar with the various flavors of Linux, this open-source system is going prime time.

As hardware giants such as IBM, Compaq Computer Corp. and Dell Computer Corp. are putting the final touches on their support for Linux, vulnerabilities are piling up.

Just do a *Linux* word search at the Carnegie Mellon Software Engineering Institute security advisory site (www.cert.org). Up pop many vulnerabilities and bugs, like myriad buffer overflows, denial-of-service vulnerabilities, a /bin/login vulnerability that allows remote root access and the latest — a default password in the graphical user interface of the Linux Piranha package, which contains the Linux Virtual Server that could be used to deface a Web server and destroy a site entirely.

For the most part, information technology professionals chalk up these vulnerabilities to growing pains — a natural debugging process any new operating system or software package goes through, whether the source code is open or not. They even contend that by virtue of their openness, open-source operating systems like FreeBSD or Red Hat Inc.'s Linux are inherently more secure.

"The advantage to open source is that any developer can look at and audit the code. Major bugs are more likely to be found and fixed because more people are looking at it under a microscope," explains Rick Redman, a security engineer at Atlanta-based Meta Secur eCom Solutions Inc., the security services affiliate of Meta Group Inc. in Stamford, Conn. "With closed proprietary systems, not as many people are looking for bugs. If I can't see the code, how do I know what the operating system is really doing?"

But such peer review does have a downside: a lack of quality assurance and proper change management, both of which have a negative impact on overall security.

"Open-source architecture allows for very rapid prototyping, but is not an established model for quality assurance like proprietary systems developed by large software companies," says Chris Rouland, X-Force director at ISS Group Inc., a security tolls vendor in Atlanta.

Rouland says that lack of change management and quality assurance controls on open-source operating systems could be problematic for small businesses that lack the staff and the budget to cross-check every line of code. And those are the organizations

most likely to adopt such systems, especially free downloadables such as Red Hat Linux or FreeBSD.

"There's nothing intrinsically better or worse about open source. But most people who get Red Hat don't pay for it. They aren't aware of the security holes and they don't know how to harden their systems. The end result is that the Linux systems are most commonly exploited to hack other sites," explains Alan Paller,

research director at the SANS Institute.

Just as with any new program, securing an open-source system begins with the installation itself. That means reading documentation, which is usually available, even for freeware.

There's the Linux Documentation Project at www.linuxdoc.org and Bastille Linux at www.bastille-linux.org, which in December released its first Linux-hardening script to make Red Hat Linux 6.0 systems more secure. For FreeBSD, documentation and security advisories are available for free at www.freebsd.org. A name search on most open-source programs will turn up similar resources.

Rouland also suggests finding out how long the system has been out of beta test, which is the only quality assurance test that open-source code is likely to get.

Finally, upon installing any open-source operating system, turn off services you don't need. And move neces-

sary vulnerable services — such as Common Gateway Interface, which crackers routinely exploit to hijack sessions or use to gain root — out of their default directories.

But if Redman is right, the security

vulnerabilities in open source will disappear rapidly. "You find a lot of holes in it when it first comes out, but these holes get less and less and the program moves toward security quicker than closed-source programs do." ▀



Deborah Radcliff is a freelance writer in Northern California. Contact her at DeRad@aol.com.

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Sun, Sand and Security: It's Conference Time

Pat goes to Orlando and learns a whole bunch about TCP/IP and threats to domain controllers — really

FIRST, TO THE READERS of this column: Thank you! You have really come through for me. I received more than 257 e-mails regarding Check Point Software Technologies Ltd.'s FireWall-1, VPNs and scripting solutions. I regret that I will not be able to respond to all of those messages, but I would like to thank you publicly for sticking with me these past two months. I enjoy writing this column, and I'm glad you enjoy reading it. If there are any features you think I should add or change, just let me know! Now, on to my regularly scheduled column.

I know why the SANS Institute picked Orlando for its SANS 2000 conference — a meeting like this is the only opportunity any of us have to see daylight and get our vitamin D! When I arrived Monday evening, I was able to pick up my books quickly. The bad news was that I should have brought a truck, because the sack they gave me was straining under the 50-pound load. Some people had three sacks. I began to wonder how I was going to get it all home.

Back in my room, I decided it was a good time to check up on a day's worth of e-mail and get ready for my first class, "IP for Intrusion Detection and Firewalls." Stephen Northcutt and Marty Roesch were the instructors. According to the literature, the class would serve as the foundation for the rest of the week. It would help me improve my already-decent understanding of the TCP/IP protocol by demonstrating how it is used against systems by crackers.

The Shadow Knows

In case you don't know him, Stephen Northcutt is an extremely respected member of the security community. He has a long résumé that includes serving as leader of the Department of Defense's Shadow Intrusion Detection Team and as director of the Information System Security Office at the Naval Surface Warfare Center. He is currently chief for information war-

fare at the Ballistic Missile Defense Organization.

Marty Roesch has an equally impressive résumé, as one of the original creators of a freeware IDS/sniffer that is similar to but has more features than TCPdump for Unix.

During the reception the night after the first class, I met Fred Kerby of the Naval Surface Warfare Center. If you haven't had an opportunity to visit its Web site (www.nswc.navy.mil/ISSEC/), I encourage you to do so. It is an excellent resource, and, as Fred said, "after all, your taxes have already paid for the information."

The next day, I had an even more exciting class, called "Computer and Network Hacker Exploits," taught by Eric Cole. Eric said he worked for the government but wasn't too specific about it. He was dynamic and full of energy,

giving information on the specific types of tools crackers use and the methodologies they use to gain access to a computer or network.

Win 2k Gotchas

You could take other classes at night, or you could go to an open forum called the "Birds of a Feather" series. Several interesting topics were discussed, and beer and popcorn were provided (a must after being in class all day!). These meetings offered a great way for administrators to get together, brainstorm and possibly grab ideas from one another.

There were some great topics, including IDS in a switched environment, Internet Information Server 5 in Windows 2000, Windows 2000 gotchas and protecting the critical infrastructure. Two of the best lectures were "Windows 2000 Security, Step-by-Step" and an impromptu meeting with Jeffrey Hunker, the senior director of the National Security Council, to discuss what the government needs to change in order to maintain security in an ever-changing technical environment.

Toward the end of the meeting with Hunker, someone brought up the fact that network TV, cable, radio and the

telephone all are governed by the Federal Communications Commission and that there are severe consequences for even the smallest infraction of one of its rules. So, why aren't Internet service providers held up to those same standards? I mean, really, don't you think ISPs should be regulated like everyone else in areas such as quality-of-service and connectivity, how they prevent piracy of their signals and how they build filters to prevent denial-of-service attacks?

Hunker seemed to hesitate on this notion, and I don't know why. The crowd seemed to be a little harsh on him.

To be quite honest, you wouldn't catch me up there in front of a bunch of security administrators. We analyze every detail by nature; you think I'm going to put my thoughts out there for you to analyze?

I guess I already do, huh?

Hacker Exploits, Part 2

Thursday was Part 2 of Ed Skoudis' "Computer and Network Hacker Exploits," which I really enjoyed. There was one problem though: About a quarter of the way through the class, I noticed there was a class called "Security in Windows 2000" that wasn't on the list when I signed up back in February. So I jumped into the new class, which was excellent.

One important thing I learned was what happens if you have domain controllers all over the country and someone breaks into a remote site with minimal security and corrupts your Active Directory database — and you don't find out until two days later. Hello, global database corruptions! That's right — you and your team have just won the restore job from hell. You not only have to restore every domain controller from the point you think the corruption began, but you have just lost every update to the Active Directory database since that point!

For large corporations, this could mean millions in lost revenue and production. All the more reason to physically secure your domain controllers. This is why servers come with keys: So you can lock the power button. Even better: Put them in locked cabinets so no one can pull the plug.

Friday and Saturday were pretty much devoted to the vendors and to minimeetings.

On Sunday, there was yet another great class, called "Windows NT Security Detailed." I learned a lot about ad-

THISWEEK'S GLOSSARY

Scripting: Writing small programs, or scripts, that carry out predefined functions.

IDS/sniffer: An IDS is an intrusion-detection system that scans for possible way to crack into a system. A sniffer is software or hardware that analyzes network traffic, looking for bottlenecks and other problems within a network.

Domain controllers: Computers that store and manage the domains, or lists, of users, equipment and resources, within a network.

Active Directory: The database Windows 2000 uses to track the domains the operating system uses.

LINKS:

www.computerworld.com/home/features.nsf/all/991025qs_links: Computerworld QuickStudy "Internet Service Provider Resources"; includes ISP-related books and news.

www.computerworld.com/home/print.nsf/all/000117qs: A Computerworld QuickStudy on TCP/IP.

www.microsoft.com/windows2000/library/technologies/activedirectory/default.asp: Microsoft information about Active Directory, featuring links to technical documents, including an overview, a glossary and the Active Directory interface and architecture. The page also includes step-by-step guides to using, managing and setting up Active Directory.

www.ntsecurity.net/: Duke Communications International Inc.'s "Windows 2000 Security News." Provides News, analysis, opinions, columns and how-to information focusing on Windows 2000 security.

vanced NT security measures and steps I can take on my own network.

Well, time to pack my suntan lotion and swimsuit. No more checking e-mail or the network from poolside. Anytime you can take your laptop, dial in through a cell phone and maintain your position of security with a Mai Tai in one hand and your PalmPilot in the other, life is good! ▀

■ This journal is written by a real security engineer, whose name has been disguised for obvious reasons. It's posted weekly at www.computerworld.com and at www.sans.org to help you and our security manager — let's call him Pat — better solve security problems. Contact Pat with comments or advice at pat_rabinski@hushmail.com, with "Pat's Journal" in the subject line.



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What if They Gave a Comdex — And No One Came?

BY RUSSELL KAY Comdex/Spring 2000, held in Chicago, was one of the strangest trade shows I've been to in a long time. Comdex/Spring has always been a poor relation that never really caught on like its fall cousin did. In recent years, the show has been getting smaller and less predictable as increasing numbers of vendors have opted to stay away.

This year, not a single major computer maker was in evidence. Oh, IBM and Compaq Computer Corp. had token "pods" inside the Microsoft Partners Pavilion, but that was it. No NEC Corp., Hewlett-Packard Co., Dell Computer Corp. or Gateway Inc. Few printer makers, except Xerox Corp./Tektronix Inc. No digital cameras, no scanners, no monitors. There was hardly any application software to be found, save for a couple of accounting packages and Microsoft Corp.'s partners. I doubt I'll go back.

The show had two sub-

themes: Windows World and the Linux Business Expo. Even the Microsoft area wasn't particularly interesting or wide-ranging. The Linux end of the show was reasonably active, but the best-known Linux vendor, Red Hat Inc., wasn't there. The Linux show had three separate merchandising/gift shop booths where you could buy various sizes of stuffed "Tux" penguins and the usual mugs, shirts and tote bags.

There was a lot of emphasis on wireless hardware and services of all types, including a Wireless Application Protocol service that lets you play

games on your cell phone, including the original Adventure game. There were lots of uninterruptible power supplies and keyboard-video-mouse switches. A large number of booths had companies offering jobs. There were dot-com and e-commerce entities of all sorts, but few really stood out.

My favorite way of approaching large trade shows is to walk the edges, past the small, low-rent booths populated by vendors and organizations I've never heard of. To be honest, most of them aren't particularly interesting, but I often find tucked in among them some really intriguing things — new ideas and quirky products that are often the most memorable items I'll take away from the show. Comdex/Spring this year was mostly "edges." In no particular order, here are the most interesting (if not, perhaps, significant) products I saw:



Now, a Palmrest Phone

Telephones have been morphing into all sorts of shapes, and at Comdex, I found a Korean-made phone built into a keyboard palmrest (Costel Co.) and another built into a mouse (Comtel Telecom Co.). But my favorite was a stand-alone phone shaped like a cute giant cricket (Intops Co.) www.costel-co.com www.comtell.co.kr www.intops.co.kr

Long-Lived Notebook Power

How about a 16-hour battery for your laptop? It's about the size of a typical notebook computer (8 3/4 by 11 1/4 in.), but it's only 3/8 in. thick and weighs just 2.2 lb. The Power-Pad 160 from Toronto-based Electrofuel Inc. uses a lithium ion battery that claims the highest energy density of any battery technology, packaged in a titanium case with five LED charge indicators. It plugs into your notebook's AC power plug and is recharged by your own AC adapter. At \$499, it's cheaper than buying several standard laptop batteries, and it's easier to manage. www.electrofuel.com

Keep Your Keyboard Dry

Remember the help desk joke about the user who claims his computer's cup holder is broken? Well, someone has designed a real cup holder that addresses the major threat of having beverages at one's workstation — spillage. The Cyber Drinkholder at-

taches firmly to the desktop via suction, yet it's instantly removable. Its support arms are adjustable, and it's nearly impossible to tip over. It's a neat answer to a common problem, but I suspect its \$29.95 price tag (\$39.95 for iMac colors instead of beige) will put off most potential users. If you're really cramped for space, there's a model that sticks on the side of your monitor. www.cyber-drinkholder.com

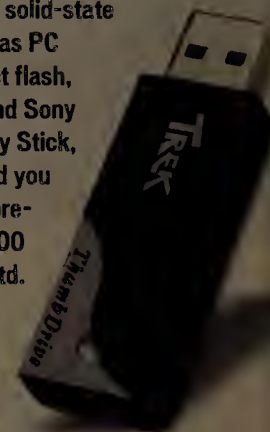
Type Harder, Lose More Weight

A pagerlike object clipped to your belt tracks how many calories you burn in a day (even while you sleep), once you've programmed it with the company's bagel-shaped "body composition analyzer." The \$300 device from Stayhealthy.com Inc. is set to debut next month. www.stayhealthy.com



Tom Thumb Storage

Adding removable storage to any computer these days is easy. With systems like the Zip, Jaz and SuperDisk drives and multiple formats for solid-state memory, such as PC Cards, compact flash, SmartMedia and Sony Corp.'s Memory Stick, what else could you want? Singapore-based Trek 2000 International Ltd. and Tacoma, Wash.-based Q-Tek International LLC claim that they know. They have a new format called the ThumbDrive. It's essentially a RAM chip (up to 256MB now, with 1GB expected within a year) attached to a Universal Serial Bus connector, making a package about 1 in. long. The connector makes for a plug-and-play device that's simple to use and needs no external power. No prices were quoted. www.thumbdrive.com



Combo Flight Bag/Worktable

Flightable is a unique take on the laptop carrying bag. It has wheels and a pull-out handle, but the latter is covered by a hard shell that hinges out, drops a support leg and creates an actual work platform. It's ideal for someone who spends too much time waiting in airports. Taiwan-based Azpac International has several models in a couple of sizes. www.flightable.com.tw

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Search Engines

BY MATHEW SCHWARTZ

IMAGINE NOT HAVING a phone book — no Yellow Pages, no White Pages, no directory assistance. It would be very difficult to use your telephone.

That's what the Web would be like without search engines. Sure, there would be people to call and places to go, but you'd be aware of only a small fraction and could find new ones only through word of mouth.

According to a 1999 study conducted by Redwood City, Calif.-based Zona Research Inc., search engines are the No. 1 method — used 77% of the time — people use to find what they're looking for on the Web. According to a consumer survey conducted last year by New York-based Jupiter Communications Inc., 88% of all online users use a search engine, and 72% use one to research retail goods.

Search engines shape many consumers' visions of what the Web contains, even though a recent study by the NEC Research Institute in Princeton, N.J., and Inktomi Corp. in Foster City, Calif., found that there are more than 1 billion unique pages on the Web and that most search engines don't even index a quarter of those pages. Worse, some 7% to 14% of the content they do index is no longer there, resulting in dead links.

Behind the Scenes

Given the size of the Web, the number of pages left untouched for years and the pages that contain popular words that immediately load unrelated sites, the job of indexing even a fraction of the Web and returning usable results requires considerable effort.

The basics, however, are quite simple: Software agents crawl the Web, looking for and storing anything not in their indexes, usually entire pages. New material can come from previously indexed pages that have changed, links to pages not yet indexed and Web site addresses submitted by third parties.

DEFINITION

Search engine: Software that provides Web site addresses that contain one or more terms or keywords specified in a user's query. The term *search engine* is sometimes used, incorrectly, to mean a manual index of the Web compiled by editors.

Web crawler: The part of a search engine that moves around the Web, copying every page it finds and indexing terms and names; also called *spiders*.

]

Comparing Search Engines

Not all search engines are created equal, but it's tough to judge which is best. Given the various proprietary algorithms, some do better with different types of queries. Here's a broad overview:

| | SITES INDEXED (MILLIONS) | RETURNS OVERALL COUNT | TRANSLATIONS | HIGHLIGHTS HIT TERMS | INTERESTING FEATURE |
|--|----------------------------------|-----------------------|--------------|----------------------|--------------------------|
| AltaVista www.altavista.com | 270 | Yes | Yes | No | Media search |
| Excite www.excite.com | 250 | No | No | No | Concept search |
| Fast Search www.alltheweb.com | 340 | Yes | No | No | FTP search |
| Go Network www.go.com | 50 | Yes | Yes | Yes | Adult filter |
| Google www.google.com | 200 | Yes | No | Yes | Rates by link popularity |
| HotBot www.hotbot.com | 110 | Approx. | No | No | Direct hit popularity |
| Lycos www.lycos.com | 50 | Yes | No | Yes | Adult filter |
| Northern Light www.northernlight.com | 240 | No | No | No | Folders |
| Yahoo www.yahoo.com | 1 (approx.); 500 from Inktomi | Yes | No | No | Inktomi search |

Media search: can search for graphics, sound, video; concept search: can search on sites similar to one selected; FTP search: searches download sites; Inktomi search: allows geographically organized searches, among other options.

Once the index is assembled, it's checked to eliminate duplicate information, such as multiple versions of a site (mirrors). Various measures are used, such as eliminating a page that repeats the same word too many times. Some search engines give special status to Web pages that use metatags that contain descriptors such as "name," "content" and "keywords," since the page authors went to the trouble of describing what their page contains.

Other search engines are

more granular, analyzing where on a page content falls in an effort to discern its importance, and noting how often a page in the search index is linked to by other pages in the index. The more popular a site is, the more likely its content will be appropriate to a given search.

When a user submits a query to a search engine or directory, elaborate algorithms go to work. Every search engine weights its variables differently, but the goal is the same: to guess what the user

wants and return relevant information. Queries are often subjected to rigorous analysis, comparing search terms to known misspellings and previous searches. If similar previous searches were successful, those results get preference.

Directories

Directory services such as those of Santa Clara, Calif.-based Yahoo Inc. and question-answering services like those of Emeryville, Calif.-based Ask Jeeves Inc. don't use automat-

ed Web crawlers. Instead, human editors manually compile Web directories. Although Yahoo doesn't index even a fraction of the pages that a search engine does, it does provide highly qualified data. However, given the 70% annual growth rate in the overall number of Web pages between now and 2003 forecast by Framingham, Mass.-based International Data Corp., directories will need ever-increasing numbers of editors to maintain their usefulness.

A new type of hybrid search engine is also emerging that uses linguistic analysis to determine whether a directory, search engine or factual database will best answer a user query. So the query "Ireland population" might return Irish census information, links to Web sites, articles, directories and other relevant content.

The Future of Searching

Several search engines already have the capability of searching for objects other than text — such as photographs of golden retrievers in JPEG format. But much multimedia content, including Shockwave animations, Flash multimedia and streaming audio and video, currently can't be indexed. The new multimedia XML standard, Synchronized Multimedia Integration Language, will make it possible to describe and transmit multimedia information.

XML is a content-description language that conveys not only information but also a definition tag describing what that information means. Thus, search engines will be able to index Web pages built with XML more easily because the tagging lets the search engines know what variables appear where on a Web page. For example, the definition tag <retail_price>"125"</retail_price> tells the search engine that "125" is a price. That enables the search engine to compare prices from various retailers, for example, much more easily and quickly than it could otherwise. ▀



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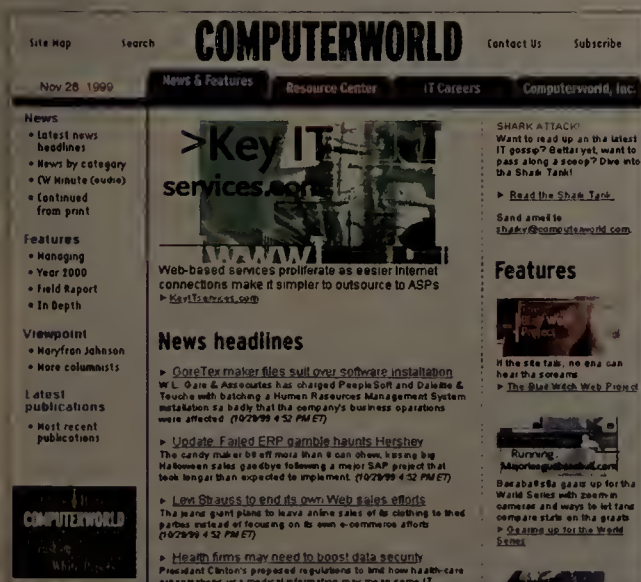
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SIMPLE SITES, PERPLEXING PROBLEMS

Most companies' e-commerce sites aren't very technically complex, but they face the same bottlenecks as larger, more complicated sites.

By Dawne Shand

RETAIL E-COMMERCE may be pervasive, but a recent *Computerworld* survey suggests that many companies' Web operations are relatively small and not technically complex. Nonetheless, companies with small e-commerce applications face the same technical bottlenecks as larger companies — limited bandwidth, problems delivering images and slow database connections.

In February, *Computerworld* conducted telephone interviews with 73 corporate information technology managers about their companies' e-commerce initiatives. In a fairly even split, 53% of those interviewed were from large corporations employing more than 5,000 people, while 47% worked for midsize companies with 500 to 4,999 employees.

When asked which operating systems run their Web sites, 60% of those surveyed answered Windows NT; 33% Sun Solaris; 14% HP-UX; 12% IBM's AIX; and 7% Linux. Although some use a combination of servers, NT clearly emerged as the most popular choice.

A majority — 55% of respondents — said they use three or fewer servers, usually on Windows NT platforms, to run their Internet applications. Of those interviewed, 74% indicated that their companies' Web sites run on 10 servers or fewer.

Performance Anxiety

The performance of these simple sites suffers from limited bandwidth (40%), difficulty delivering detailed images (23%) and slow database connections (21%), just as more complex Internet applications do, according to respondents. To alleviate these bottlenecks, 60% of the IT managers are adding bandwidth and Web servers, 55% have purchased high-speed equipment and 42% are load-balancing traffic at the server and switch levels. Thirty-eight percent of survey participants outsource their systems.

The survey finding that a typical site is running on two or three Windows NT servers indicates that these e-commerce applications process a relatively small number of transactions. One NT server can handle approximately 200 concurrent users.

To Walt Smith, chief engineer at iXL Enterprises Inc., a consulting firm in Atlanta, this suggests that "Windows NT is good enough to meet many requirements," from both business and technical standpoints. He says Sun Microsystems Inc.'s Solaris is the most scalable operating system and adds that he is surprised by how few companies use it (33%). Smith points out that the e-commerce systems depicted in the media have long feature lists: customer relationship management components, personalization features,

business rules and statistical analysis. Such complexity, which would require dozens of servers for support, wasn't apparent in this survey.

"Maybe [retail] e-commerce isn't as complex as we think," says Smith, adding that a storefront and a basic transaction server suffice for many companies.

This has been the case for Wawa Inc. The Wawa, Pa.-based company manages 500 convenience stores in five states and has more than 12,000 employees. Its marketing group maintains its Web site, where customers can buy merchandise and locate Wawa stores.

Like 38% of the firms represented in the survey, Wawa has outsourced its Internet application because it hasn't had the expertise to handle the project in-house, though it has complex business systems in place. The company has been using RemoteWare from Atlanta-based XcelleNet Inc. to connect its stores and handle order processing, shift scheduling and other business processes. David Clifton, network services and telecommunications manager at Wawa, says his group plans to take responsibility this year for the Web site and convert RemoteWare to a Web-based application.

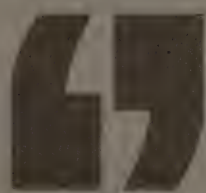
OshKosh B'Gosh Inc. has also outsourced the development and hosting of its Web site. The Oshkosh, Wis.-based children's clothing manufacturer employs more than 5,000 people. In the past, the company sold directly to merchants and didn't need an IT infrastructure to sell directly to consumers.

OshKosh B'Gosh wanted to be on

the Web, but it didn't have the expertise to build a strong e-commerce site, according to John Dell'Antonia, vice president of information systems. The company didn't have the catalog software that would enable it to sell to consumers. And he didn't want to worry about bandwidth and server issues.

So OshKosh B'Gosh outsourced the creation of its Web site to Pandesic LLC in Sunnyvale, Calif. In 16 weeks, the site was up and running. It went live in September 1999. The front end was designed specifically for OshKosh's business, but the back end runs on "canned" software, according to Dell'Antonia. Although there are some limitations on what the software can do on the back end, the application connects directly to OshKosh's inventory supply. More than 99% of all orders are shipped the next day, he says.

In the beginning, the system had a problem handling the number of peo-



The biggest trade-off in using [a canned] system is its limited functionality.

JOHN DELL'ANTONIA,
OSHKOSH B'GOSH



JAMES SCHNEPP

ple who logged on simultaneously, Dell'Antonia says. Pandesic took care of that by adding NT servers, justifying the decision to outsource, he says.

Dell'Antonia said "the biggest trade-off in using [an outsourcer's] canned system is its limited functionality," but he's "pretty happy" with the outcome.

Oshkosh, like 23% of respondents' firms, has difficulty delivering detailed images quickly — the second most frequently cited problem in the survey behind limited bandwidth (40%). Its graphics-intensive front page doesn't download as quickly as Dell'Antonia would like. OshKosh signed with Akamai Technologies Inc. in Cambridge, Mass., to improve performance — as bigger Internet sites have also done.

Services like Akamai's move content closer to the customer, reducing the latency that results as requests travel the Internet. Content caching is a technique used by big and small companies alike. It involves moving graphics to sites where they can be more easily accessed, either beyond the firewall on the corporate server or to a third-party provider that hosts the content.

Database connections came in third (21%) in the ranking of problems cited on the survey. Slow authentication and uneven server loads tied for fourth on the list at 18%. When asked what steps had been taken to solve their performance problems, 60% of those interviewed said they used additional Web servers. Another 60% indicated that they had purchased additional bandwidth. Fifty-five percent purchased networking equipment, and 42% purchased load balancing software.

According to iXL's Smith, networking equipment requires more expertise for implementation and costs more up front, but in the long run, networking equipment that routes traffic across servers is more effective than a software. Rounding out the list of most popular solutions for bottlenecks were changing company security procedures (30%) and changing credit authorization procedures (14%).

When asked how satisfied people were with technical solutions to their Internet bottlenecks on a scale of 1 (lowest) to 7 (highest), 88% responded with 4 or higher. Eighty-nine percent of those who outsource responded 4 or higher.

The survey indicates that many companies participating in the explosion of e-commerce are starting their Web sites with relatively simple technology but are wrestling with the same problems encountered by more complex e-commerce applications. Solutions to those problems are emerging, but the move to e-commerce isn't an overnight process. ▀

Shand is a freelance writer in Somerville, Mass.

WEB SERVERS: How many Web servers are currently running your commerce site?

| | |
|------------|-----|
| 1 | 14% |
| 2 | 23% |
| 3 | 18% |
| 4 | 7% |
| 5 to 10 | 12% |
| 11 to 50 | 7% |
| 51 to 200 | 1% |
| 201 to 500 | 1% |
| Don't know | 16% |

Percentages don't equal 100% due to rounding

SURVEY BASE: 73 IT MANAGERS

BOTTLENECKS: Which of the following are among the top three biggest performance bottlenecks on your e-commerce site?

| | |
|--|-----|
| Bandwidth availability, especially during peak traffic periods | 40% |
| Trouble delivering detailed images and multimedia | 23% |
| Database connections | 21% |
| Slow authentication and/or security practices | 18% |
| Uneven server loads | 18% |
| Problems with site design | 16% |
| Sluggish credit-card authorization | 15% |
| Delivery of dynamic content | 14% |
| Failure of third-party site elements such as ad banners | 10% |
| Other | 9% |
| Don't know | 3% |
| None | 19% |

RESPONSES: 152

PERFORMANCE: Which of the following steps has your organization taken to improve the performance of its e-commerce site for your customers?

| | |
|--|-----|
| Added Web servers and/or mirrored to additional servers in other locations | 60% |
| Increased bandwidth and/or leased additional lines | 60% |
| Purchased high-speed networking equipment such as routers and switches | 55% |
| Invested in load-balancing appliances or software | 42% |
| Outsourced to a Web hosting service | 38% |
| Changed security procedures | 30% |
| Changed credit authorization procedures | 14% |
| Other | 10% |
| None | 3% |

Multiple responses allowed

RESPONSES: 231

THIS IS A STORY ABOUT PROGRAMMERS AND SYSTEMS administrators who, by and large, don't want to speak on the record because they're afraid of being fired. They're smugglers who sneak unapproved operating systems into corporate offices without telling upper management.

These activities aren't in the same league as gunrunning or drug trafficking, but that doesn't mean you can't get fired for doing them.

In many cases, the unapproved operating systems are the so-called open-source systems, which come with all of the source code, so that a programmer can rewrite them as much as he wants. These versions, with names like Debian GNU/Linux, FreeBSD or Red Hat Linux, are produced by loosely knit groups of programmers who contribute their code into a vast commonwealth of software that can be freely shared. The members contribute what they can and have the freedom to improve the code.

At first glance, many information technology managers from traditional backgrounds recoil in horror at the thought of open-source operating systems. The freewheeling exchange of source code seems like a recipe for total chaos, and every IT manager knows that preventing chaos is the most important part of the job. No one ever got fired for buying from Microsoft Corp., IBM or Sun Microsystems Inc.

Some programmers, however, love the open-source systems. They come with all the source code, which often means less cursing at a black box. Talented programmers with a good knowledge of open-source systems can often finish jobs much faster.

Consider an engineer I'll call "Bob." He's an open-source smuggler. His boss wanted first and foremost to keep the networks running and the file servers serving. His boss believed that the best way to accomplish this was to pay one company to provide order. You get what you pay for, he assumed, and one way to get a lot is to pay a lot.

Bob's problem was simple. One of the company's newly acquired branch offices ran Windows NT and

some custom software that was hard-wired to work with the old network. The new bosses insisted that Bob integrate the existing network with the new, incompatible network that had its offices in another state. Bob considered doing the job the official way. He calculated the hours, weighed the amount of red tape required to reinstall, figured out the travel time and then considered whether it was even possible to rewrite the software. The potential bill skyrocketed.

Then he had an idea. He grabbed an obsolete 50-MHz 486-based PC and installed FreeBSD on it. This Linux cousin is well-known and loved in the networking community because it's a descendant of the Berkeley System Distribution (BSD) versions of Unix that formed the original backbone of the Internet. In fact, most Internet software was originally conceived of on machines running BSD, so it's often the most compatible operating system for Internet applications. A few days later, the old, previously discarded computer was up and running, translating the data from one system to the other and gluing the two networks together.

"It took about four days because I'm so slow at FreeBSD," Bob says, "but I could now redo the entire thing if I had to in just one afternoon."

POLITICALLY CORRECT PCs

Bob's story is a happy one. The low cost pleased his boss, and no one looked too closely at the guts of his "NT-compatible" router. The boss apparently preferred to concentrate on the price tag.

Unfortunately, many programmers are in situations like Bob's. IT departments face endless problems just keeping their data synchronized and their computers working smoothly. Everyone knows that strong rules like "Always buy Microsoft" often make life a bit simpler. But everyone also knows that it sometimes just makes good sense to break the rules.

The world of operating systems may seem like a placid environment where all the blood was shed

Continued on page 84

Psssstt! Wanna a good, reliable operating system on the cheap? Thing is, you just can't tell your boss about it. By Peter Wayner

OPEN-SOURCE

MARCUS RANUM, CEO of Network Flight Recorder, says his company bundled its application with OpenBSD to create a secure, easy-to-use product that installs quickly from a single CD-ROM - and that the customer can't tinker with



STAN BAROUGH

SMUGGLERS

OPEN-SOURCE SMUGGLERS

Continued from page 82

years ago when Microsoft achieved its final dominance. That's what many managers want their IT staffs to believe: Microsoft on all machines means harmony everywhere.

But sometimes the right tool isn't made by Microsoft, IBM or whoever the dominant player happens to be. Increasingly, engineers are turning to open-source operating systems because having the source code lets them customize their work and solve the hard problems.

Another anonymous programmer reports that he got involved in a duel with a rival branch in his company that protested when it found out he was using the security-conscious OpenBSD operating system to process credit-card transactions.

"[The leader of that branch] wasn't happy and was determined to defeat us, so he decided to start a separate e-commerce organization that we would have no input into which would [have been] based entirely around Windows NT 4.0," he says. "That was in September. [Their system] still doesn't work. But the BSD kit on the other side of the company has been handling credit-card transactions securely since October."

THE RIGHT TOOL FOR THE JOB

There are plenty of other success stories out there on the Net. Many of the contributors to open-source systems say the tools are more flexible and easier to adapt to complicated tasks. This feature is especially valuable when the engineers are called upon to produce new applications or offer new services over the Internet. When the machines start working successfully, the smart manager doesn't inquire too often or too closely about the operating system vendor.

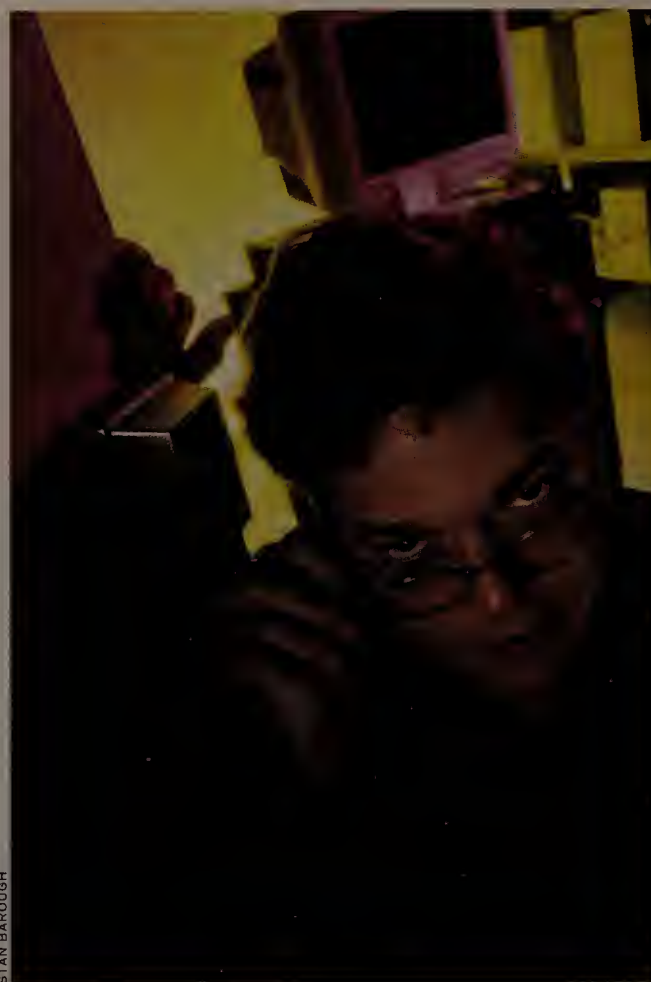
The success stories can be found in some strange places. The TiVo television recorder is a kind of digital VCR that stores MPEG-encoded versions of television programs on its hard disk. The system comes with a number of new features, such as an "instant replay" that quickly jumps back seven seconds.

Underneath the user interface is the Linux operating system. TiVo Inc. in Sunnyvale, Calif., customized the operating system to speed up the real-time tasks it needed and started shipping Linux deeply embedded in the box. The TiVo user is none the wiser, because all the Linux calls are hidden from view.

The programmers involved usually cite two reasons for their success. First, the source code makes it easier for them to tweak, revise or extend the operating system. While companies like Microsoft or Sun make it possible to extend their operating systems, they often keep some of the information secret to maintain their leverage.

And because the Internet was originally built on machines running BSD, the basic protocols were specified, prototyped and finalized in that environment. Therefore, it's just easier to create new Internet applications using the original article.

That compatibility is one reason why Apple Computer Inc. is rewriting its Mac OS operating system to incorporate much of the code from the open-source community's FreeBSD and NetBSD. The core,



STAN BAROUGH

The Unix heads hate NT, and the NT heads hate Unix, so our answer is that it's like a toaster: There are no user-serviceable parts inside.

MARCUS RANUM, CEO,
NETWORK FLIGHT RECORDER INC.

which the company calls Darwin, is also being shared with the world in the hope of making it easier for Macintosh customers to work with the systems. Still, Apple hasn't opened up all the forthcoming Mac OS X code. The slick user interface and many of the time-saving features that attract new users are being kept proprietary.

IT professionals working with Mac OS X report mixed experiences. Those who use only the open-source parts of Darwin say they enjoy the new opportunities. But those who need access to the part that's still proprietary grouse about the restrictions.

One anonymous programmer says his boss heard his pleas for an open-source operating system and suggested Mac OS X. Because it's both open-source and a product from a big company, it has the aura of respectability and openness, he says. But in his case, the openness didn't help, and he ended up switching to FreeBSD.

Many open-source operating systems make it simple to strip away all but their most necessary parts. This flexibility makes it possible to run on less-expensive hardware and also get the maximum perfor-

mance out of high-end hardware. The extra layers of gloss that make systems like Windows NT easier to understand can also make them less efficient, because they prevent a systems administrator from stripping away unnecessary functions.

"I reckon a PIII-450 properly configured with about 512MB of RAM will give me around a 400% to 500% performance increase over the incredibly expensive Sun hardware at around a tenth of the cost," says an engineer who supports open-source systems.

COPING WITH CONFIGURATION

While many programmers are quite positive about open-source solutions, some are more circumspect. Rob Newberry, a programmer at Group Logic Inc. in Arlington, Va., has been an avid fan of Linux. Some of his networking code has, in fact, been made part of the standard Linux kernel.

Still, he says that his company is thinking seriously about converting its mail server back from Linux to Windows NT. Group Logic has documented several cases where the sendmail program running on the Linux server lost an e-mail message. While it's had few other problems with Linux, he says the software is still difficult for much of the staff to manage; Windows NT is just easier for most of them to use and reconfigure. According to Newberry, saving the cost of a Windows NT license just isn't worth it.

"Even though there are some of us here who respect Linux and work on Linux, we are rapidly trying to phase it out. It just kind of becomes a maintenance headache," he says. "We have lots of engineers here. There [are] only a few of us who know the Linux tricks." The folks who know Linux have better things to do than maintain the mail system, he notes.

This effect is leading some companies to roll the operating system into their product and sell the two as a pair. Network Flight Recorder Inc. in Rockville, Md., creates software that turns a PC into a spy that watches a network for suspicious activity. Abnormal data-flow patterns that might sneak by firewalls will set off alarm bells when this device spots them.

Naturally, the creators of the product want this system to be as secure as possible, so they turned to OpenBSD, a cousin of FreeBSD designed to eliminate security holes. They stripped out extra parts of the system and built a special version of the kernel that handles only their workload. They bundled all of this on a single, bootable CD-ROM that takes over the PC.

Marcus Ranum, Network Flight Recorder's CEO, explains that the CD-ROM also simplifies the technical support. The user can't change anything on the machine, so nothing can inadvertently be screwed up.

"The CD-ROM has a bootstrap loader and a kernel and our own set of applications inside. There are no user services inside," he says. "There's nothing on this sucker except the one application. It takes about 12 minutes to install our product, and that's the time to boot up and autodetect."

Ranum says hiding the operating system from everyone, including the professionals who know how to maintain one, is a smart solution. Every system takes time to learn, and his company wants to make its Network Flight Recorder product simple to use.

Ranum says, "The Unix heads hate NT, and the NT heads hate Unix, so our answer is that it's like a toaster: There are no user-serviceable parts inside." ▀

Wayner is a Baltimore-based writer and author of the forthcoming book *Free for All* (HarperCollins), which examines the open-source movement. You can reach him at pcw@flyzone.com.

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IT for Business

Helping Content Sites Make Money

CrossCommerce automates merchandising for sites lacking e-commerce infrastructure

BY DAVID ESSEX

WEB SITES that serve up content and community, such as AltaVista.com, iVillage.com and Salon.com, have struggled with the issue of how to make money.

Such businesses need to "monetize" their prodigious traffic, and San Francisco-based CrossCommerce Inc. thinks it can help them do that by giving them tools that enable them to sell products from inside their sites while relieving them of the cost and hassle of maintaining an e-commerce infrastructure.

To accomplish this, CrossCommerce does three key things: It runs all the back-office security and transaction processing from third-party data centers, behind Web addresses on customers' sites; it maintains the necessary relationships with shippers and suppliers, relieving customers of inventory risk; and it tells sites how to merchandise in a way that complements their unique content.

CrossCommerce boasts a strong management team. Co-founder and President Peter Nordberg was the visionary and president of WebLogic Inc., now the largest application server vendor. Co-founder and Chief Technology Officer Raj Sarasa is an e-commerce infrastructure expert who helped design Pacific Bell's billing systems. Vice President Jim Oliver holds a doctorate from the University of Pennsylvania's Wharton School and he has worked at Andersen Consulting and Hewlett-Packard Co.

After BEA Systems Inc. bought WebLogic in 1998, the WebLogic founders pondered the opportunities in content-oriented Web sites. "It was apparent to us that a lot of sites were going to begin to need to monetize traffic," Nordberg re-

calls. "There seemed to be a divide between content providers and commerce sites. We began to run some focus groups trying to understand what their needs were."

They noticed two trends. One was that banner advertisements weren't working; click-through rates, according to Cambridge, Mass.-based For-

rester Research Inc., had fallen from 10% in 1994 to half a percent in 1998. The other was that affiliate marketing programs, in which sites pay to have their links displayed on other sites, were growing in popularity but had a conversion rate of only 2%, according to CrossCommerce.

The founders started to build their E-Merchandising Platform in March 1999. One component, the Adaptive Intelligent Merchandising application, provides the transac-

tion, payment and site-serving software, as well as algorithms for matching products to content. The Virtual Product Warehouse provides links to middlemen that maintain relationships with thousands of manufacturers and provide the fulfillment and customer service behind every sale. The Merchandising Intelligence component tracks customer behavior, traffic and revenue patterns and provides access to merchandising experts at CrossCommerce.

The firm promises customers product revenue above wholesale prices and then shares the margin with them. Merchandisers come for standard consulting fees of around \$1,500 per day, and some customers pay monthly subscription fees of roughly \$10,000.

High Aspirations

Several customers will go online when CrossCommerce ships the platform this month. AltaVista.com Inc., based in Palo Alto, Calif., is the company's highest-profile customer.

Another, USAGreetings.com in San Francisco, a purveyor of free and inexpensive greeting cards, uses CrossCommerce to sell gifts and related items. "It is very hard for us to be a fulfillment agent for any products we provide," says USAGreetings.com Vice President Santanu Dasgupta. The CrossCommerce system was easy to set up, he says, and customer service is superb. "So far, we're really happy with it," he says.

David Cooperstein, a research director at Forrester, says content sites are demanding new revenue sources, but CrossCommerce faces tough competition. "The issue they have is [that] they have a hard time differentiating themselves," he says, chiding the company for not directly targeting manufacturers.

Nordberg has put off such opportunities, at least for now. CrossCommerce wants a piece of consumer sales at content sites, a market that could total \$184 billion by 2005, according to some analysts' forecasts.

"I fully expect to own the lion's share of that marketplace," Nordberg says. ▀

Essex is a freelance writer in Antrim, N.H.



CO-FOUNDER PETER NORDBERG says he expects CrossCommerce "to own the lion's share" of the consumer sales market

CrossCommerce Inc.

Address: 650 California St., 24th floor, San Francisco, Calif. 94108

Telephone: (415) 315-1000

Web: www.crosscommerce.com

The technology: Outsourced e-commerce merchandising

Why it's worth watching: Outsourcers who help sites figure out how to turn "eyeballs" into sales could share in new revenue generated by the sites.

Company officers:

- Peter Nordberg, co-founder, president and CEO
- Raj Sarasa, co-founder and chief technology officer
- Jim Oliver, co-founder and vice president of business development

Milestones: Founded January 1999; first product expected in May

Employees: 30; expected to double quarterly through year's end

Expected profitability: Q1 2002

Burn money: \$20 million round of financing completed in January with Donaldson, Lufkin & Jenrette Inc.'s Sprout Group and two other venture capital firms

Products: E-Merchandising Platform, consisting of an e-commerce "engine," virtual product warehousing and merchandising consulting, generally sold on a margin-sharing model.

Customers: AltaVista Co., Homeowners.com Inc. and USAGreetings.com

Partner: QRS Corp.

Red flags for IT:

- CrossCommerce shares its niche with at least a half-dozen firms.
- Its value to content sites has yet to be proven.
- Its shared-margin business model is dependent on sites' success in generating new revenue streams.

the buzz

STATE OF THE MARKET

Worry-Free E-Commerce

CrossCommerce.com's E-Merchandising Platform competes directly with similar offerings from several companies and with affiliate marketing programs at major Web sites.

Epod Corp., Escalate Inc., Iconomy.com Inc., iVendor Inc., Vitessa Corp. and YellowBrix Inc. all sell outsourced services designed to take the worry out of adding e-commerce to Web sites.

CrossCommerce names Redwood Shores, Calif.-based Escalate as its major competitor. "They're pretty similar," says analyst David Cooperstein at Forrester Research. "Escalate seems to be more of a soup-to-nuts vendor."

CrossCommerce co-founder and President Peter Nordberg characterizes Escalate as pushing more of a storefront solution. Escalate's senior marketing director, Erik Frieberg, says CrossCommerce provides a less-comprehensive solution than Escalate and focuses on the lowest-margin part of the market.

As a result, says Frieberg, CrossCommerce, iVendor and the like must charge a markup for low-priced products such as CDs. They rank low in search results from shopping programs that are designed to find the lowest prices. "They're assuming that the customers aren't going to shop around," he says.

In contrast, Escalate targets vendors that can maintain healthy margins on higher-ticket items by entering into exclusive e-commerce arrangements, such as clothing company The North Face Inc. in San Leandro, Calif., and San Francisco-based Quokka Sports Inc.

Examining Alternatives

Seattle-based Vitessa purports to have a cleaner, simpler product that allows "buy" buttons to be placed on any HTML document. "We don't have a separate database that needs to be changed," says spokesman Martin Levy. "All we do is process the business rules." The company started with e-commerce infrastructure and later added merchandising and supplier relationships.

CrossCommerce competes indirectly with alternative revenue sources, especially affiliate marketing programs, in which popular e-commerce sites like Seattle-based Amazon.com Inc. sell links to vendors with complementary products. While CrossCommerce says only 2% of customers make purchases from such links, Cooperstein says they're proving to be popular. "Affiliate marketing has been very successful," he says, adding that it accounted for 13% of site revenue last year. —David Essex

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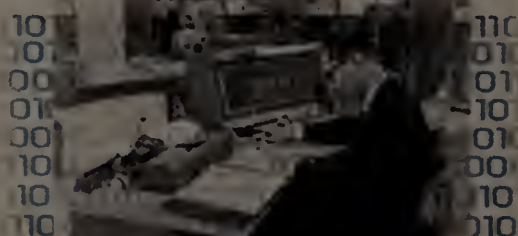
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E-Strategists

They are the brains behind successful e-commerce projects, the ultimate pitchmen. Consider the experiences of Scott Banister. By Deborah Radcliff

WHO: Scott Banister
COMPANY: Idealab, Pasadena, Calif.
TITLE: E-commerce strategist
PREVIOUS TITLE: Founder/CEO, e-commerce start-up
REPORTS TO: CEO, COO
SKILLS FOR JOB: Working knowledge of Internet architecture, protocols, languages; ability to translate capabilities of Internet into cutting-edge online marketing strategies and to oversee projects through development and execution

EVEN BEFORE planning and executing an e-commerce project, you need an idea. Many of these ideas come from the brains of e-commerce strategists, who work in the realm of possibilities.

You'll find e-commerce strategists in brick-and-mortars, developing and executing marketing and business plans for the Internet. More often, the e-commerce strategist works at new Internet businesses and portal communities.

They don't come cheap. So strategic to the business are they, they work alongside the chief technology officer and often the CEO.

Reading Scott Banister's ré-

sumé, your first reaction is, "Hey, not bad for a college dropout." He founded two Internet businesses and sold one to Microsoft Corp. He is now responsible for starting new businesses at Internet start-up think tank and funding company Idealab in Pasadena, Calif.

Banister, 24, is the ultimate e-commerce strategist. All day, he has ideas, pitches them and oversees their execution.

An acknowledged technogeek in high school, Banister says he owes a lot of his success to luck and timing. In 1994, he started working on his computer science degree at the University of Illinois, the same place Mosaic (now Netscape) was born.

At that time, Bill Gates was making the PC a household appliance. And Banister was overwhelmed with the marketing potential of this new medium. As dozens of search engines popped up on the Web, Banister got his first idea. How could retailers easily capitalize on these search engine workhorses to make their presence known on the Web?

He and his college friends coded and posted a one-stop, self-help registry site that linked the retailers to the leading search engines. They named it ListServe, posted it on the Web and went on about their studies.

Small and midsize businesses began using it. Word spread, and ListServe became a popular service. The students added more service offerings such as ListBot, a tool for managing mailing lists, and renamed their company SubmitIt/ListBot. They eventually merged their company with LinkExchange, a San Francisco-based banner exchange business. The merged company caught the attention of Microsoft, which was looking for a one-stop electronic-business service site for its small-to-midsize target markets. Microsoft bought the combined company in December 1998 and put all those services on an e-commerce development and services site called bCentral.

Rattling Around the Brain

For a while, Banister toyed with investing in Internet start-ups. But then he was approached by Bill Gross, who was looking for someone like Banister to help identify and nurture start-up opportunities.

So now Banister creates e-commerce ideas, then figures out the best way to market them. His first priority is keeping ahead of the e-commerce curve. So he spends a lot of his time dissecting other Internet businesses from a customer perspective to understand what works, what doesn't and what could work better.

One of his first projects at Idealab was the March launch of ShopMarket.com, which mixes the online auction format with the online retail format. "I came up with the idea by looking at the market and seeing that eBay is a great open marketplace based on the auction format, but it's annoying

Just the Facts

JOB DESCRIPTION: The e-commerce strategist oversees the execution of e-commerce ideas and oversees e-commerce strategy development. This job isn't highly technical but requires some background in Internet development projects and a working knowledge of cutting-edge Internet technologies.

DRIVING FORCES: The Internet economy is spinning forward at a dizzying pace. E-commerce strategists must keep one step ahead of the competition.

CAREER POTENTIAL: High start-up Web business.

SALARY RANGE: \$85,000 to \$200,000, usually with bonus. Salaries are commensurate with other executive positions and vary widely from company to company.

when all you want to do is buy a used *Titanic* DVD and you don't want to go to Auction A, lose it, then go to Auction B, C and so on," Banister explains.

"So I came up with the idea of an open exchange format, like a stock market, where sellers can start markets for any type of product and post asking prices while buyers choose to pay those asking prices or bid on them."

Banister then developed a marketing plan, focusing on such concerns as which customer segments to go after at what stages, the most aggressive ways and promotions to bring customers to the site, how to keep those customers and how to cross-promote and share customers among Idealab's 20 e-commerce start-ups.

Although he has three years of hands-on programming experience from his college days (mostly in Perl, HTML and Common Gateway Interface script writing), Banister's most valuable skill is translating the Web's technical capabilities into a marketing plan.

You can hear it throughout his dialogue. It's peppered with phrases like, "This is what the Internet is capable of." ■

Radcliff is a freelance writer in Northern California. Contact her at DeRad@aol.com.

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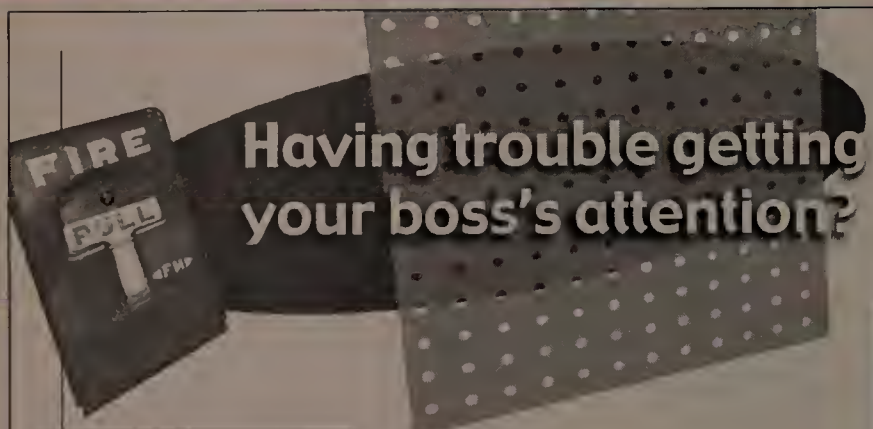
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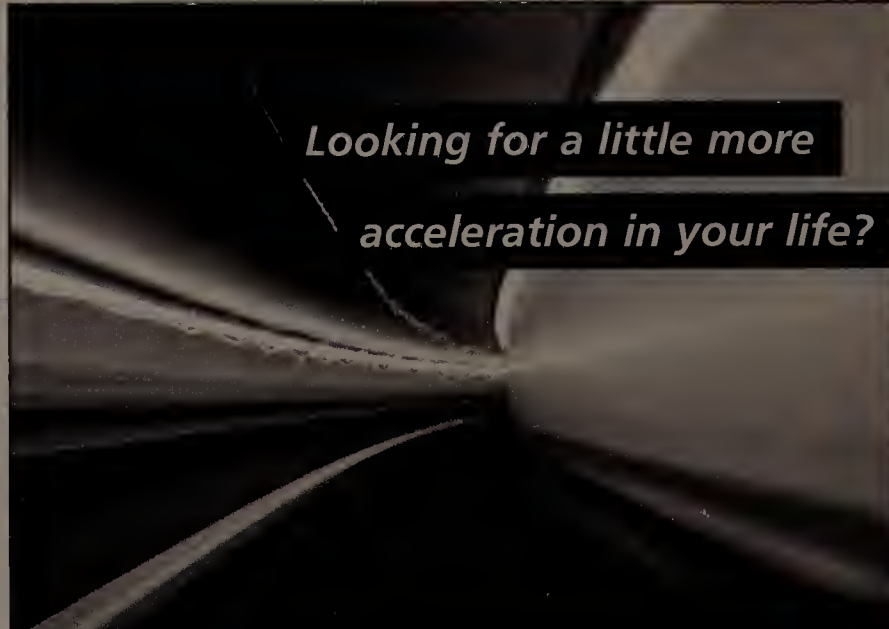
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Software Engineers (BIOS) - Professionals qualified to design and develop BIOS firmware must hold a Bachelor's degree in CS or a related discipline & a minimum of 3 yrs exp in a BIOS development occupation, as well as exp w/developing power management drivers for notebook or desktop PCs, PC/ AT desktop notebook architecture, PCI bus, X86 processors & USB.

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Principal Technologist: Define and implement distributed, enterprise-scale, transactional workflow applications for integrating legacy systems and databases with the Web using standards-based, object-oriented solutions in C++, Java and CORBA/IICP. Mentor and lead project teams in the design, implementation and delivery of reliable, fault-tolerant, multi-tier, multi-threaded, object-oriented internet solutions using CORBA and internet technologies. Develop and teach formal training courses in the areas of distributed object computing and legacy integration using CORBA. Requires: M.S. in Computer Science and 6 months experience with Web and CORBA/IICP-based collaborative computing. Demonstrated ability in designing and building multi-threaded, distributed, client server applications using CORBA, CORBAServices, C++, Solaris Threads and Web standards (HTTP, CGI, HTML). Knowledge of error handling design patterns recovery and reliability issues in distributed applications. Programming knowledge of Illustra and Oracle DMBSS. Ability to develop object-oriented wrappers for database APIs using CORBA. 40 hrs./wk (9 to 5); \$90,000/yr. Send two resumes/response to Case # 19992271, Box 8968, Boston, MA 02114.

Computer & Information Technology Jobs in cities across the US: Openings for computer programmer/analysts, project managers/leaders, systems analysts, programmers, computer communications and network specialists, software consultants, hardware engineers/consultants, database administrators and information engineering developers. Requires bachelors degree or higher (Masters/Ph.D.) in Computer Science or field closely related to the applicant's area of specialization, plus experience with mainframes, microcomputers, depending upon the position under consideration. Prefer detailed knowledge of computer operating systems, languages and suites such as C, C++, JAVA, Cobol, DB2 or IDMS, ActiveX, Graphical User Interfaces, client/server architecture such as Oracle or Sybase, case tools, Internet tools and TCP/IP, LAN & WAN protocols, OS/MVP, UNIX tools, depending upon the demands of the particular position. Middleware experience a plus. Work on client's site and at our facilities. Hours and salary negotiable commensurate with job and experience. If you are a top IT professional, talk with us! Excellent benefits. Equal Opportunity Employer. Send resume to Human Resources Department, L & T Information Technology Limited, 120 Wood Avenue, Suite 300, Iselin, New Jersey 08830, including salary requirement.

ORACLE DATABASE Administrator

Synapse, a progressive and innovative marketing company, seeks a highly motivated professional to join its fast-paced, entrepreneurial environment. Assume responsibility for maintenance and performance tuning of several Oracle databases including installation and setup. Five years' related experience preferred in an Oracle DB (Oracle 8) environment. UNIX scripting and Sun Solaris experience preferred.

Excellent compensation and benefits, free lunch and health club. Send resume with salary history to: **Synapse Group, Inc., HR, Dept. OD, P.O. Box 16919, Stamford, CT 06905**, fax (203) 329-7020. Visit our website at www.synapsegroupinc.com. No calls please. EOE M/F/D/V

Synapse

Multiple openings for permanent Programmer/Analyst and Database/Software Engineer positions from entry to senior level in Jacksonville, FL to design, develop, program and test business enterprise systems involving TPF, Sales Force Automation, Data Warehousing, Business Metrics, E-Commerce, Internet, and others using Object Oriented Programming/Design, relational database modeling, distributed systems, and current web technologies. Particular tools include one or more of: Java, C/C++, VisualB, ASP, ActiveX, UNIX, SOL, Windows NT, Lotus Notes, Perl, COBOL, IMS, CICS, DB2, CORBA, HP/UX, COM/DCOM, OLE, CGI, Internet protocols, and others. B.S. in Comp. Sci., Eng'ng, Math, or related area. Will accept combination of education, training and experience in lieu of degree. Prior experience and M.S. required for some positions. Competitive salary/bonus/benefits offered. Send resume to: **iSolutions.com Corp., 10600 Skinner Lake Drive, Suite 500, Jacksonville, Florida 32246**. Fax: 904-565-1162 email: knielfeld@isolutionscorp.com

Full-time Test Engineer: responsible for developing test plans and test cases for testing of various products on various platforms. Act as Team Leader to set the testing strategy for controller cards. Set up servers and workstations and perform the test operations on server management cards. Execute test plans and test scripts as defined in testing. Describe and identify failures during testing. Interact with developers by explaining test procedures and steps to reproduce problems. Provide technical assistance to other testers. Load and test applications under various operating systems. Maintain servers in the department. Create test reports for the programs tested. Support other departments in diagnosing, analyzing and solving problems. Must have a Bachelor's Degree in Electronics Engineering (foreign degree equivalent acceptable) and 5 years of experience in job offered or 5 years in a position with same duties. Salary \$60,000. Send Resumes to: American Megatrends, Inc. 6145-F Northbelt Parkway Norcross, Georgia 30071 Attn: Nanda Chheda

A leading consulting organization experiencing phenomenal growth seeks to augment its technology capabilities require software professionals in the e-business/enterprise integration/CRM practice. The candidates should have at least 2-3 years of professional experience in any of the following skills: C, C++, Java, XML, Powerbuilder, Visual Basic, Foxpro, Visual Foxpro, J Builder, Visual Interdev, Cold Fusion, Broadvision, Oracle DBA, DB2DBA on various platforms. BS degree (or equiv.) and two years experience with the above skill set for Programmer Analyst or MS degree (or equiv.) and 1 year experience for Software Engineer. Travel and relocation. Excellent Benefits.

Apply to:
Attn: Recruiter
Infoplus Inc.
1114 Colehurst Crescent
Apex, NC 27502

Software Engineer - Design and plan new projects and IS standards; act as technical leader-design solutions (client sever/intranet/extranet), design and develop using programming languages, visual basic, PowerBuilder, Access, C++, Java, Visual Basic Script, RDBMS, SQL Server, Oracle on Windows NT and Unix Systems. Implement, produce and distribute applications to end users; perform hardware/software installation and configuration. Requirements include a Master of Science Degree in Computer Science, Computer Engineering or Civil Engineering and one year of experience in the job offered or in the related field of Software Engineer. Knowledge of: Visual Basic, PowerBuilder, Access, C++, SQL Server, Oracle, Windows NT, UNIX, SOL and ODBC. Applicants must have unrestricted authorization to work in the United States. Salary \$72,441/year. 40hours/wk. Respond with two copies of resume to Case #19990398, P.O. Box 3968, Boston, MA 02144

Tech Support Team Leader. Resp: for analysis, design, development, test, code & implement financial/banking multi-lingual client/server application using gupta sql 5.0, centura 1.1, sybase 11, isqi, quest, team windows in unix & windows nt environment; test & analyze feasibility results, design user flowcharts, present & recommend software solutions to clients; remote dialing into US & intl clients' db to provide support using tools such as telnet & pcanalyzer using tcp/ip & ppp; analyze & code stored procedures in sybase; make correct system & sybase settings to optimize client site product performance; fine tune client's db to improve server response time using sybase db admin utility; document user & functional records; assign job & track staff progress; draft & present progress reports to sr mgmt. \$61592/yr, 8a-5p M-F 40 hrs/wk, BSEE/BSCS+ 2yrs exp in job offered or as a prog/analyst. Resume to Dept of Labor/Bureau of Workforce Program Support, PO Box 10869, Tallahassee, FL 32302, Attn: EH.JOFL2071946.

Web Engineer - Berwyn, PA & various client sites Build s/w application to provide technical architecture of web sites. Build user interface applications & backend databases. Create prototypes & functional spec for s/w projects. Perform coding in HTML, Java, CGI, Perl & Visual Basic. Create technical methodologies for engg solutions to web-based development problems. Determine new web tech to utilize based on client needs. Must have: Proof of legal authority to work in US; Bachelor in Comp Sci or Engg plus 2 yrs of exp in job offered or as a S/w Egr. or Sys Egr. or Prog Analyst or Sys Analyst; Exp. in HTML, Java, CGI, Perl, & Visual Basic. 40hrs/wk M-F 9am-5pm \$60,600/yr Send resume or C.V. to the PA Job Bank, 444 N. 3rd St., 3rd Fl., Phila, PA 19123 Job Order #7061421

Business Manager

needed for NJ IT Co to execute s/ware projects, provide IT profits on contract basis, & manage client accounts.

Apply to:
HR,
Global Consultants,
601 Jefferson Rd,
Parsippany, NJ 07054.

Software Engineer to design, develop, analyze, implement and integrate software for Internet and e-commerce applications using C++, Java, SQL, XML, VBScript, JavaScript, DHTML, ASP and Windows NT; develop COM objects for web site development using Visual C++ and Visual Basic; utilize multiple development tools Visual InterDev, IIS, Visual Source Safe, SQL Server, ADO and ObjectStore. Require: Master's degree (or equivalent) in Computer Science/Computer Engineering and six months experience in the job offered. A Bachelor's degree with five years of progressively responsible experience may be substituted for Master's degree. Salary: \$65,000 per year, 8 am to 5 pm, M-F. Mail resume to: Director of People Services, Nexchange Corporation, 400 Northridge Road, Suite 600, Atlanta, GA 30350 (Ref. No. Y11001)

Systems Engineer, Malden, MA: Analyze, design, develop & implement client server applications using Microsoft SQL Server, Sybase SQL Server, Oracle & Informix. Develop Financial, Marketing Warehousing & Inventory Management systems using Visual Basic, Holos & Power Builder. Determine time frames, funding limitations, work plans & procedures for accomplishing projects. Oversee staffing requirements, recruitment & assignment of project personnel as well as allotment of available resources to various phases of project. Provide technical support. Req'd. Masters* in Engg. or Comp. Sci. or Math. 1*yr exp. in job offered. *Will accept Bachelors degree & 5 yrs. of progressive work exp. in lieu of Masters & 1 yr. experience. 40 hrs/wk., 9a-6p. \$85,668.00/year. Applicant should submit two (2) copies of resume in response to Case #19991306, P.O. Box 8968, Boston, MA 02114.

Fulltime Systems Analyst: responsible for analyzing user requirements, procedures and problems to automate processing or to improve existing computer applications. Responsible for designing applications for the company and its clients. Help clients create applications on the desktop environment and lead a team to develop applications using Visual Basic and Clipper. Develop source code using various versions of Clipper Software that has a proprietary database interface. Must have a Bachelor's Degree in CS, EE, or BBA with at least a minor in CS, or related field (foreign degree equivalent accepted). Must have two years of experience in the job offered or in position with same duties. Salary \$62,000/yr. Send resume to Raj Shekaran at **Software Research Associates, Inc. 70 Mansell Court, Suite 100, Roswell, Ga. 30076**.

Full time Software Engineer responsible for the development of the software modules of the company's Remote Access Companion (MegaRac) using C/C++ language, Microsoft Windows NT graphical user interface, TCP/IP, design different modules of the company's Remote Access Companion (MegaRac) related to software. Review the design of the module. Develop the corresponding module, debug and test the module. Responsible for coordinating with test engineers, customers and other team members. Must have a Master's degree in Computer Science or foreign degree equivalent. Must have 2 years of experience in the job offered or 2 years of experience in a position with same duties. Salary \$65,000/yr. Send Resumes to: American Megatrends, Inc. 6145-F Northbelt Parkway, Norcross, Georgia 30071. Attn: Nanda Chheda.

MBNA Hallmark Information Services, a subsidiary of a major national bank, is actively interviewing for a limited number of openings in its Distributed Systems department in Newark, Delaware.

SOFTWARE ENGINEER

Must have a bachelor's degree in computer science and six months of experience as a Software Engineer or six months in a software design/development occupation. Must have experience with UNIX, C, Java, HTML, SQL, RDBMS, and Windows NT, which may be gained through education or employment.

Competitive salary and benefits package offered. Send resume, referencing code no. N063012906, to MBNA America, 1100 N. King St., Wilmington, DE 19884-2233.

Systems Engineer (Temple Terrace, FL) Detail design, coding, testing, implementation, support of production systems for business applications using Visual C++, C++, C, Neuron Data, HTML, Unix, Informix, Unix Shell, SOL, ESOL/C and Windows 95 (PC operating System). Identification, implementation and documentation of effective methods of software design. Reqts: Master's Degree in Computer Science, Engineering or Mathematics; 2 yrs exp in the job offered or 2 yrs in the related occupation as a Programmer/Analyst. 2 yrs exp must include exp with Unix System, Visual C/C++, SOL and experience with standard structured development methodologies. Experience with Neuron Data and Informix. 40 hours per week, 8:30am-5:00pm. \$65,000/year. Send resume to Dept. of Labor/Bureau of Workforce Program Support, PO Box 10869, Tallahassee, FL 32302-0869. Ref: JOFL# 2074474.

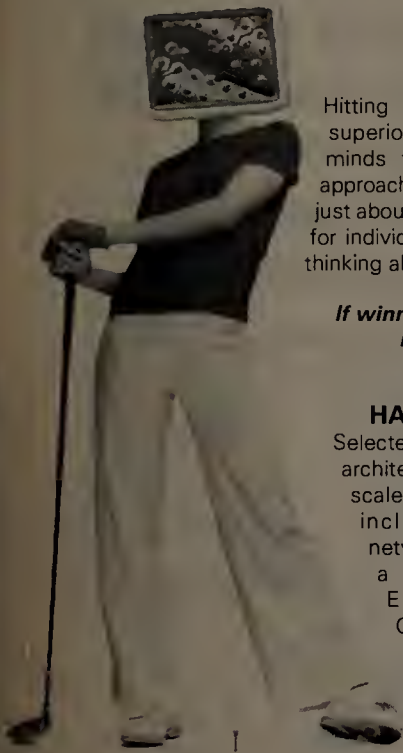
Software Engineer: Design, develop, test, code and implement software, computer systems and Web site applications to meet clients needs based on users' requirements; interact with clients and analyze their requirements; design and implement database management systems; use C/C++, Perl 5, CGI, Javascript, HTML, Oracle, SOL*Plus, PL/SQL, Developer/Designer2000 and stored Procedures; provide technical support and troubleshooting. Req: Master's degree in computer science/engineering; no experience necessary. 40hr/wk, 8-5pm, \$32.46/hr. Send 2 copies of resumes to PO Box 8968, Boston, MA 02114. Ref No. 19991706.

Software Engineer, Malden, MA: Analyze, design & test various applications using object oriented methodologies, relational database modelling and client/server technologies using ORACLE with SQL*PLUS, PL/SQL, PRO* C and tools. Design & develop GUI applications using FORMS 4.5 & REPORTS 2-5. Perform Database administration using SOL DBA/SERVER MANAGER. Req'd. Masters* in Engg. or Comp. Sci. or Math. 1* yr. exp. in job offered or 1 year exp. in any Computer Related Profession. *Will accept Bachelors degree & 5 yrs of progressive work exp in lieu of Masters & 1 yr exp. 40 hrs/wk., 9a-6p, Mon-Fri., \$72,252.80/Yr. Applicants should submit two (2) copies of resume in response to: Case # 19990917, PO Box 8968, Boston, MA 02114.

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HARDWARE DESIGN ENGINEERS

Selected candidates will be responsible for the architecture, design and development of large scale enterprise server hardware platforms, including processor, memory, I/O, and networking subsystems. Prerequisites include a BS and/or MS degree in Electrical Engineering, Computer Engineering or Computer Science combined with 1-5 years recent experience in an engineering environment, preferably within the computer/client server industry. Qualifications include: ASIC/FPGA logic or physical design, PCB design, systems debug.

Position # AD3/I2TC/019/069465

SOFTWARE ENGINEERS

Selected candidates will have 1-5 years recent experience in Networking Input/Output (software/hardware), Operating Systems Development and/or Middleware Development. Additional requirements include a BS and/or MS in Electrical or Computer Engineering or Computer Science. Qualifications include: knowledge of NT Device Drivers, NT internal, C/C++, Java, Windows NT development environment, Intel Server technology, Embedded Systems development. The ability to code, test, integrate and support software on NT and Enterprise NT environment is essential. **Position # AD3/I2TC/019/066193**

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68 Liberty Drive
Dayton, NJ 08810[FL]
Fax: (732)297-6116[FL]
E-mail: nr.vista@worldnet.att.net

CyberTech Systems, Inc. provides IT strategy consulting, systems integration and software development to clients nationwide. We have immediate, full-time opportunities for both entry-level and experienced professional in any of the following areas:

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NETWORKING

- ◆ Systems Engineers (MCSE)
- ◆ LAN/WAN Specialist (CISCO)

APPLICATION DEVELOPMENT

- ◆ Microsoft Certified Solution Developer (Visual Basic, Visual C++)
- ◆ Database Administrators (Oracle, SQL Server)
- ◆ Web Based Development (Java or JavaScript, CORBA, Microsoft ASP, ActiveX, COM/DCOM)

Job opportunities are also available for Sale Managers, Marketing Managers, Business Managers, Human Resources Managers, Controllers and Technical Recruiters. Bachelor's or Master's degree required, depending on position. We also accept the foreign educational equivalent of the degree or the degree equivalent in education and experience. Excellent benefits. Send confidential resume and salary requirements to: CyberTech Systems, Inc. 1111 W. 22nd Street, 8th Floor, Oak Brook, IL 60523 OR 8 Neshaminty Interplex, Suite 209, Trevose, PA 19053. An equal opportunity employer.

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So how does the figure of \$1.1 billion in revenues last year sound? And the fact that we're doubling our U.S. sales presence by 2002?

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Head of Sales/Branch Manager

Postgraduate or graduate degree • at least 10 years' experience, including management of high-level negotiations, shrewd strategic business planning, international exposure, and sharp commercial and financial knowledge.

Account Director/Senior Account Manager

BS/BA • at least 10 years' experience, including the management of major corporate accounts and building/coaching a sales force • direct sales experience.

Account Manager

BS/BA • at least 9 years' experience (at least 5 years' with a graduate degree), including direct sales experience in the telecom industry.

Sales positions require excellent negotiation, customer relationship building, and computer skills. Bilingual skills preferred.

Sales Engineer

BS in Engineering or hard science • at least 5 years' experience (3 years' with an MS in Engineering or hard science) • extensive knowledge of datacom: IP, routing, Intranet/Internet, ATM, frame relay, multiplexing, switching, LAN, and network security • voice applications knowledge desirable.

Senior Service Manager

BSEE or equivalent • at least 10 years' experience (at least 6 years' with a graduate degree) • at least 8 years' experience in voice and data services.

Service Manager

BSEE or equivalent • at least 9 years' experience (at least 5 years' with a graduate degree) • at least 7 years' experience in voice and data services.

Engineering positions require in-depth technical knowledge of applicable products and services, technical consultancy, and computer skills. Bilingual skills preferred.

Proposal Design Engineer

BSCS, Math or Engineering • in-depth knowledge of ATM, Frame Relay, IP networking, and traffic/performance analysis.

Proposal Manager/Technical Writer

BS/BA degree • 2-4 years in the telecommunications industry • demonstrated technical writing/editing proficiency • Word, Excel, and Internet research skills.

Proposal Pricing Analyst

BS/BA in Finance or Accounting • 2-4 years' related finance, marketing or pricing experience • working knowledge of financial and costing methodologies.

Technical Marketing positions require strong computer and communication skills; foreign language skills are a plus.

To be considered, you *must* type the job code **Salesforce** on your resume or cover letter, then forward to: **Global One, Attn: HR/Salesforce, 12490 Sunrise Valley Drive, Reston, VA 20196. Fax: (703) 435-3390. E-mail: globalone@isearch.com (without attachments).** We are proud to be an EEO/AA employer that maintains a smoke-free, drug-free workplace and performs pre-employment substance abuse testing. No agencies, please.

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Software Engineer - Reqs. MS Comp Eng & 2yrs Exp in job offered or 2 yrs related exp as programmer. Research new technologies; design/develop advanced telecommunications client-server software using C, UNIX, Visual C++, Windows, Informix, DBMS & MS-Access. 40 hrs/wk; 9:00am-5:00pm. \$65,000/yr. Send Resume to Dept. of Labor/Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302. Indicate - JO#FL2066314.

Network Specialist

wanted by Comp Sales & Services Firm in Cranston, RI to provide Win NT network support. Must have BS in Comp Sci, Elec Engg or equiv.

Respond to: HR Dept, First Resource Computer, Inc., 590 Reservoir Ave, Cranston, RI 02910.

Miami-based corp. specialized in developing online sales/marketing solutions for Spanish and Portuguese speaking audiences, is seeking a CIO to be responsible of overseeing all operations and designing the overall company's strategy. Requirements are knowledge of information technologies and systems, global Internet market building and re-engineering technology infrastructure. Management experience in a fast pace environment dealing with administrative, human resources and legal issues. A master in science degree or 5 years of experience in the Internet business field is required. Send resumes to b_jobs@hotmail.com.

Software Engineer, Andover, MA; Analyze, design and develop systems in COBOL, C, Prolog, Oracle Designer/2000, SOR using SQL *DBA and Oracle as RDBMS on different operating systems. Req'd. Masters in Comp. Applic. or Comp. Scie. or Engg. or Math. 1 year exp in job offered or 1 yr exp in Computer Related Profession. 40 hrs/wk, 9am-6pm, Mon-Fri. \$70,000/Yr. Applicants should submit two (2) copies of his/her resume in response to case # 19992034, P.O. Box 8968, Boston, MA 02114.

Senior Systems Analyst wanted by Insurance Co in Philadelphia, PA. Must have Bach or equiv in Comp Sci, Math or Business Admin & 2 yrs exp dsngng, coding & testing browser-based applics using Oracle stored procedures & triggers, Oracle 7.3, Unix, Win NT, SOL Loader, ERWIN.

Respond to: Elizabeth A. Stutz, Independent Blue Cross, 1901 Market St, Philadelphia, PA 19103-1480

Programmer Analyst, Malden, MA; Analyze, design, develop, test & document Client Server application using Oracle 7.x, Developer/2000, PL/SOL, C & Pro*C. Install Oracle, creation & maintenance of database, tablespace, Rollback segments, users, profiles, Tables, Indexes & stored procedures. Configure SOL*Net. Use Solaris & Novell Netware. Req'd 3 yrs exp in job offered or 3 yrs exp. in computer related profession. 40 hrs/wk., 9a-6p. \$60,000/year. Applicants should submit two (2) copies of resume in response to: Case #19991437, PO Box 8968, Boston, MA 02114.

Software Maintenance

Programmer sought by S/ware Reseller in Beverly, MA. Must have Bach in Engg or equiv & 2 yrs exp providing customer maintenance & support, and customization & implmtn using VB Script.

Respond to: Personnel, SmartTeam Inc., 900 Cummings Center, Ste 307T, Beverly, MA 01915.

Software Engineer wanted by Software Devlp & Consulting Co in New York, NY. Must have BS in Comp Sci or Info Sys or Applied Math or Electrical/ Electronic Engg & 2 yrs exp analyzing, dsngng & implementing client server s/ware for various asset mgmt, leasing & procurement systems using object-oriented tech with relational databases.

Respond to: HR Dept, Centurion Software, Inc., 1170 Broadway, Ste 315, New York, NY 10001.

Computer Programmer

wanted by Computer Software Co in Roslyn Heights, NY. Must have BS in Comp Sci & 2 yrs exp writing & dsngng new applics, versions of current s/ware.

Respond to: HR Dept, Viewpoint, 4 Expressway Plaza, Roslyn Heights, NY 11577.

Programmer Analyst

wanted by Comp Services Co in Flanders, NJ. Must have Bach in Comp Sci, Comp Engg or Elec Engg & 1 yr exp planning, dvlpng, testing & documenting comp applics using C/C++ and JAVA with relational database mgmt systems in UNIX & Win NT envrmt. Respond to: HR Dept, Planet Access Networks, 3 Goldmine Roads, Flanders, NJ 07836.

Software Engineer, Malden, MA; Analyze, design & develop software applications using Oracle, PL/SOL, SOLDBA, Forms 4.5. Reports 2.5 under Windows HP-Unix, Sun Solaris based environment. Perform database administration activities on Oracle for development and production database. Req'd. Masters in Comp. Sci. or Physics or Math. 1 yr exp. in job offered or 1 yr. exp as Programmer Analyst. *Will accept Bachelors degree & 5 yrs of progressive work exp in lieu of Masters. 40 hrs/wk, 9a-6p. \$76,252.00/year. Applicants should submit two (2) copies of resume in response to Case # 19991119, P.O. Box 8968, Boston, MA 02114.

Programmer Analyst wanted by Comp Services Firm in Edison, NJ. Must have Bach in Comp Sci, Comp Engg or Elec Engg & 1 yr exp planning, dvlpng, testing & documenting comp s/ware using C/C++, PL/SOL, Pro*C & SOL Loader with ORACLE database in UNIX & Win envrmts.

Respond to: HR Dept, Ram Compu Creations, Inc., 295 McKinley Ave, Edison, NJ 08820.

Programmer Analyst; \$45K/yr, 8a-5p; 40hr/wk. Plan, dvlp, test & implmt comp prgms & systms using VisualBasic, Delphi, SOL, Informix, Access, Excel, ERWin, Active X on Win NT. Bach or equiv w/major in Comp Sci or Engg, Electronics, Electrical or related branch of Engg or Social Sci. Job Loc: Duluth, GA.

Send resume to: Dinesh Raturi, President, GTS, Inc, 3761 Venture Dr., Bldg 100, #223, Duluth, GA 30096.

Web Developer:

Design, develop & implement Web Sites utilizing Active Server Page tech., ISAPI dynamic link libraries, JAVA Script, VB Script, HTML, MS-SOL & Client Active X controls. B.S. Deg. in Eng., Comp. Sci. or related, (or equivalent in educ. & exp.) 2 yrs. exp. req.

Fax resume to Mr. Tharpe: 770-998-9694.

MIS Administrator

wanted by Co involved in industrial recycling of non-hazardous waste in Staten Island, NY. Must have Associate Degree in Comp Sci & 2 yrs comp exp.

Respond to: HR Dept, Interstate Materials Corp, 211 Johnson St, Staten Island, NY 10309.

Programmer Analyst, Wilton, CT; Analyze, design and develop software applications using Oracle, Cobol, Basic and C++ on Windows NT. Provide technical support. Req'd. 2 years exp. in job offered. 40 hrs/wk. 9:00am-6pm, Mon-Fri.

Send resumes to Matrix Information Technologies, 15 Lambert Common, Wilton, CT 06897. Attn: Brijinder Singh.

Database Design Analyst; 8a-5p; 40 hr/wk. Dsgn, dvlp, maintain & test logical & physical d/bases & interfaces using RDBMS, C, C++, Visual C++, lex, yacc, perl, batch, shell, Oracle, Sybase, SOL, TCP/IP, Informix, UNIX & Win NT. Masters or equiv in Comp Sci or Engg; Electrical or Electronic or related field of Engg. Job loc: Norcross, GA. Send resume to: Devender Reddy, VP, Charter Prof'l Svcs, Inc, 7001 Peachtree Industrial Blvd, Ste 405, Norcross, GA 30092.

Programmer Analyst, Boston, MA; Analyze, design & develop software applications using UNIX shell scripts for system configuration, administration & performance monitoring and tuning of Sun Solaris/SunOS UNIX systems. Provide software & hardware technical support for Sun Solaris/SunOS systems including Y2K migration, server break-fix, volume manager, NIS, NFS, printing services, data management (backup and restore) & applications deployment or distribution. Req'd. Bachelors in Comp. Engg. or Comp. Scie. 2 yrs exp in job offered 40 hrs/wk. 9am-6pm, Mon-Fri., \$75,000/year. Applicants should submit two (2) copies of his/her resume in response to Case #19992289, PO Box 8968, Boston, MA 02114.

Senior Application Developer: design computer application systems, modify existing applications, debug, test and maintain software system on UNIX platform. Implement systems in C, C++, SQL Plus, PL/SOL and Pro C on UNIX. Develop database models and design applications in the context of LDAP directory database, Oracle, JAVA, Javascript, and web environment in HTML. Require MS or equivalent in CS, CIS, or MIS. Proficiency in Java, C, C++ and LDAP. \$55,277/yr., 40 hrs/wk, 8:00 a.m. to 5:00 p.m. Contact Derindea Theiss, Reference Code SRAPPDT, MCI WorldCom Network Services, Inc., 500 Clinton Center Drive, Clinton, MS 39056 or electronically: derindea.theiss@worldcom.com. The applicant must have legal authority to accept employment with MCI WorldCom Network Services, Inc. in the United States.

Software Engineer wanted by Financial Institution in West Palm Beach, FL. Must have Bach/For. Deg. equiv in Comp Sci/Engg & 2 years exp analyzing, dsngng, dvlpng, testing & implementing client server applics using MS Visual Basic, MS Access, MS SOL Server, Sybase SQL Server and Borland Delphi.

Respond to: Jag Prog OCWEN Federal Bank, 1675 Palm Beach Lakes Blvd, West Palm Beach, FL 33401

Programmer-Analyst

needed for NJ IT co to analyze, dsng, dvlp, test, maintain applic & d/base systems.

Apply to: HR, Global Consultants, 601 Jefferson Rd, Parsippany, NJ 07054.

Database Administrator

wanted by Computer Services Firm in South Plainfield, NJ. Must have Masters in Comp Sci, Comp Engg or Comp Applics & 1 yr exp coordinating physical changes to ORACLE data bases, coding, testing & implementing physical data base using knowledge of ORACLE data base mgmt systems.

Respond to: HR Dept, Information & Technology Management, 900 C Oaktree Rd, South Plainfield, NJ 07080.

COMPUTER PROFESSIONALS

New Jersey-based computer software consultancy firm seeks computer professionals (Software Engineers, Systems Analysts, Programmer Analysts, Database/Warehousing Administrators, Network Engineers) with any of the following skills: Unix, NT, C/C++, Corba, Java, JDK, JDBC, SNMP, HP-Openview, COM/DCOM, Networking, Web Server/Developer, X/Motif, TCP/IP, Oracle, Informix, Sybase, SOL, DB2, Tuxedo, ATM, Frame Relay, TMN, Q#, Routers, Hubs and E-Commerce. Must have Bachelors or equivalent in Comp Science or Engg and 1 yr s/ware experience. Respond to: HR Dept, B2B Technologies, Inc, 201 North Center Drive, North Brunswick, NJ 08902.

Full time Software Engineer responsible for developing, enhancing and maintaining Software components using C, C++, Intel Assembly, and Graphical User Interface (GUI) Programming in DOS, UNIX and Windows NT environment. Work with test and validation groups to ensure components are tested thoroughly. Responsible for following software development procedures. Create and provide technical documentation. Must have a Master's degree in Electrical Engineering, Computer Science, Math or related field and 2 years of experience in job offered or position with same duties. Salary: \$84,000/yr. Send Resumes to: American Megatrends, Inc. 6145-F Northbelt Parkway Norcross, Georgia 30071. Attn: Nanda Chheda.

SOFTWARE DEVELOPERS

SAFCO Technologies, Inc. is a leading international supplier of wireless planning, measurement, analysis and predictive tools. We are currently seeking top notch professionals for positions in our Melbourne, Florida, location to assist in Object Oriented Software Design; Prototyping and Development using VB5.0 and VC++ 8.0; development of real-time software pertaining to acquisition of data from a wireless radio telephone network; development of post-processing software, pertaining to analysis of wireless air interface data. Requires: BSCS or BSEE or related discipline. Entry Level. No exp. Req. Send this ad and your resume to HR Mgr., SAFCO Technologies, Inc., 600 Atlantis Road, Melbourne, FL 32904.

Full time BIOS Software Engineer responsible for BIOS customization, isolating BIOS problems. Responsible for the release of BIOS. Establish customer relations. Write and maintain technical documents. Responsible for working with assembly language training programs, development system, test system and any computer hardware and software necessary to reproduce customers problems. Responsible for using C/C++ language. Must have a Bachelor's degree in Computer Systems Engineering, EE or related field and 2 years of experience in job offered or position with same duties. Salary: \$58,250/yr. Send Resumes to: American Megatrends, Inc. 6145-F Northbelt Parkway Norcross, Georgia 30071. Attn: Nanda Chheda.

Team Leader

for NJ IT Co to dsng/dvlp telecommunication & DBMS applics using OOM.

Apply to: HR, Global Consultants, 601 Jefferson Rd, Parsippany, NJ 07054.

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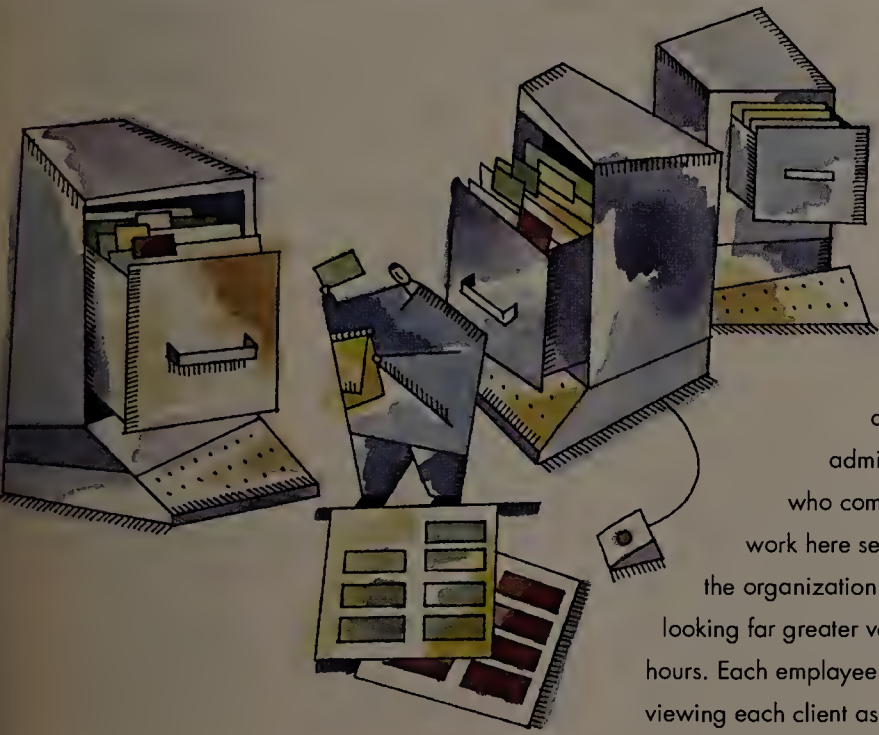
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ITCAREERS
Where the Best Find Better

COMPUTERWORLD

by Carole Hedden

Whether it's managing the millions of bits of data involved in creating an animated film or the myriad operations and tasks involved in operating a major corporation, ORACLE applications are being used as the backbone of major segments of American industry.



Here's a look at just some of the career opportunities in ORACLE provided by a truly diverse group of companies.

Arc Technologies Group, Inc. Pittsburgh, PA

"Our business is information management" says Barry Gladden, president of the enterprise business solution group at Arc Technologies Group, Inc. "We assist companies with management and organization of information for the purpose of decision support utilizing ORACLE Enterprise and web-based technologies."

Gladden says Arc Technologies Group is a 21st century boutique for ORACLE business systems. "Everyone today needs a firm with experience with the latest releases of ORACLE, whether its 11-i or 8-i," he explains. "To respond, we have tight alliances with ORACLE and other partners to assure we can get to market as quickly as possible with the new implementation skills. We constantly are examining where we need to be today to win projects, where we need to be in a couple of years in terms of skills, and what needs to be done to make sure our associates have the skills they will need tomorrow."

The company globally recruits associates and managers who are highly experienced with ORACLE technologies, across vertical markets. The behavioral interviewing process used by Arc Technologies puts applicants through the paces. "For instance, when we're hiring a sales manager, we'll have the candidates develop a 90-day sales plan with a level of detail that allows us to understand how they're thinking and whether they understand us as a company. After all, it's our direct sales model and boutique focus that set us apart from larger generalists."

"This interview process makes attracting some people difficult," admits Gladden. "Those applicants who complete the process and come to work here see it as a real differentiator for the organization and demonstrates that we are looking for greater value in people than billable hours. Each employee must be an entrepreneur, viewing each client as his successful piece of the business. Clients expect us to deliver not just technology services, but more importantly, solutions for business needs."

Arc Technologies uses a matching process of today, tomorrow and next year when developing career paths with associates. "Everyone talks about career paths, but here at Arc Technologies pay and incentives are based on it," Gladden adds. The company will also offer stock incentives and maintains focus on behaving as a family company, despite an ever-growing size and reach. "This is a dynamic group of people, and we plan to hire about 70 associates in the coming year. We are investing heavily...our future is our people," Gladden says.

Conley • Canitano Cleveland, OH

With almost 20 years in relationships behind it, Conley • Canitano, also known as CCAI, has built its business on providing application development and packaged applications to clients that cut across all industries, with special emphasis in financial services and manufacturing.

"ORACLE has been our largest growth area for the business over the past year," says David Duryea, head of the ORACLE practice. The ORACLE side of the business has grown three-fold over the past three years with much of the growth coming in 1999. "We have a plan to grow the ORACLE practice over the next 12 months to be about 25 percent of the total company."

CCAI applies ORACLE solutions in a succinct way for its clients. "We have the Sale Side - store fronts to sell and service your product or service," explains Duryea.

"We have Buy Side projects for our clients, which focus on the purchasing side or procurement exchange." The company also addresses the Inside aspect of applications - traditionally ERP and self-service systems such as expense reporting for employees. The Bridge Side includes CCAI's support center, post-implementation support and upgrades from ORACLE. "We run about 70 percent of the projects undertaken by our clients," Duryea adds.

"We're always in the market for high quality people. We like to see an average of at least 10 to 12 years in business and two to four years of ORACLE experience," he says. "On the technical side, we hire database analysts, as well as people who understand the functionality of ORACLE applications and technology and who have done data conversions and customizations. The business function people are those who understand the business operation and can set up applications or configure solutions based on customer needs."

Once working with CCAI, employees have access to ORACLE systems as they are introduced through an Intranet-enabled system that allows you to self-train. "We also have the capability to conduct collaborative meetings over the Internet providing us with the ability to provide virtual training - we learn together," says Duryea. In addition, the company assists associates in earning and maintaining accreditation as certified public accountants and certified production inventory management specialists.

CCAI views people development as a doughnut with three areas of development: technical/functional skills, analytical skills ("Your ability to envision and receive the big picture and distill it into an action plan," explains Duryea) and people skills. "And there at the center of the doughnut - the hole - is what we call raw motivation. Without raw motivation, the other three areas can't grow," he adds.

"The bottomline is that we hire high quality people, very talented people," Duryea says. "We have some of the best projects in the industry because of our experience. We are a proud group."

Hot Skills: ORACLE

ITechnology, Inc. **Cambridge, MA**

A few years ago, the engineering firm Camp Dresser & McKee Inc. (CDM) looked at future growth and found it could increase revenues through its internal information technology group of about 40 people. CDM could open a new IT market, building on its 52 years of experience and its network of more than 100 offices worldwide.

CDM's subsidiary, ITechnology Inc., began working with ORACLE in the early '90s, using CDM's databases and productions systems as the test environment for what later went to market. Today, the advanced projects and partnership continue. "In the past year, ITechnology build an Intranet-based data warehouse to deliver critical information regarding client projects online," explains Lauren Courtemanche, staffing manager. "This gives our project managers the information they need to make real-time, collaborative decisions. In the Windows 2000 environment, we've developed a single control panel that brings ORACLE Projects information to the desktop. This assists in managing projects and information without toggling into and out of various applications."

Primarily, ITechnology supports a variety of vertical markets including architecture and construction organizations, as well as pharmaceutical research. "We have two missions, internal and external, and our employees have the choice of working on either type of project," says Courtemanche. "Employees don't get worn down and the variety of projects keeps their workload diverse and interesting."

By initially piloting ORACLE products in an internal production environment, ITechnology staff evaluates performance of ORACLE solutions before putting them to work for a client. "We can figure out the quirks and extended capabilities in advance, due to our partnership with ORACLE," Courtemanche says.

As a standard of operation, ITechnology invests the time and money to keep employees ahead of new technologies "in an environment where you can test drive the product before going to the client," Courtemanche says. "We also allocate \$4,000 to \$6,000 annually for your ongoing education. We have very low turnover and evaluate the marketplace on a quarterly basis to assure we are paying competitively.

"And we have stability," she adds. "We have a commitment with ORACLE to partner in new business development. You have easy access to new technology, we have testing so you can try out your work before going to the client, and you will be rewarded based on what you can do, not how long you've been doing it."

Parametric Technology Corporation **Waltham, MA**

Fifteen years ago, Parametric Technology started out as a single-product software company, specializing in CAD software. Today, PTC is a billion-dollar software company whose stable includes proEngineer software. With ORACLE as the backbone of its internal operations, the company also uses ORACLE as a basis for its research and development, most recently resulting in an all-new application, WindChill. For employees, the result is a healthy mix of career opportunities to serve the PTC business, but also to be involved in R&D.

The new product, WindChill, is Internet-enabled and allows engineers to work collaboratively on designs and schematics, regardless of location. PTC continues to look for openings where advanced ORACLE technology can create opportunity. With the release of ORACLE 11-i, such an opportunity exists. "This is about much more than an upgrade to software," says Steve Horan, PTC's senior vice president of information technology. "It's about re-engineering processes and evaluating new, better ways to work."

Horan is looking for people with a background in ORACLE and the technical expertise to stretch its capabilities through new software developments. In addition to needing people with technical analysis skills and implementation experience, the company also values people who can bridge the world of use with the world of development.

"We need business analysts to help build the bridge between end-user and technical developers," he says. While Horan is looking to hire ORACLE implementers for technology use within PTC, once on board you have the opportunity to transfer back and forth between IT and research and development, finance, or other professional services.

The company provides a career planning system that evaluates employee needs and business expectations on a quarterly basis. "We are a young, aggressive company," Horan says. "Most people who come here want to work hard with other people who want, and are able, to make a difference. There's a long leash for you to go out and make change."

PDI/DreamWorks **Palo Alto, CA**

Where else can you go to work and create the opening scene for the latest animated flick while also getting help with your own private documentary film? At PDI/DreamWorks the opportunity exists and is very much part of operation.

"We basically have two divisions – feature animation and what we call CAFÉ – commercial and film effects," explains George Bruder, co-director of production engineering for PDI. "In the feature animation division, we have people working on one feature animation project that's in production and another one or two in development. With CAFÉ, we are using an entire mix of 3D with live action and feature effects to create scenes used within films or commercials."

This animation isn't about taking pencil to sketchpad. It's about database and production management systems grown by PDI's staff on top of an ORACLE database. "We're taking a lot of flat files and extracting them into a real database," explains Bruder.

Kevin Cureton, production engineer and software developer, says PDI tends to overlap with web companies in terms of the skills needed for its projects. The key difference is the film industry itself. "We are operating like a big web site, moving around gigabytes or terabytes of data in conjunction with a large data or file base."

Cureton says the company is looking for people with experience in database administration, "someone who can get our ORACLE database tuned up to work 24-by-7 and move production data into the database. We also need someone with strong ORACLE administration skills to assist in generating rendered frames. And we're always looking for someone with good programming and scripting background. The end result is that we work in the intersection of people developing animation or effects against our database."

Bruder says PDI has more technical toys "than any business I've ever worked at. This is a great place for someone whose interested in film or film production. We put an emphasis on training so you'll be exposed to all sides of the business," he says. "The more everyone has an understanding of how the whole process works, the better we are able to add value.

"There are lots of reasons to work here – we work on cool movies, and it is fun. It's something else to work on a piece of software that eventually leads to film production, and then you sit in the theater and watch the creative work of approximately 350 people – and you watch the box office returns. It's a very different kind of feeling where film studio, software engineering and assembly line of production all come together."

For more information about advertising and upcoming supplements, please contact Janis Crowley at 650-312-0607.

Hot Skills: ORACLE

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in IDMS, ADS/O and COBOL. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of IDMS, ADS/O and COBOL. Salary: \$66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Joseph Stratico, Pittsburgh/Allegheny Co. CareerLink, 425 Sixth Ave., Suite 2200, Pittsburgh, PA 15219, Job No. WEB92960.

Senior Programmer/Analyst.

Design, develop, implement and test mainframe computer applications for business clients. Perform systems analysis. Tools: JCL; Oracle; COBOL; C/C++. Bachelor's degree in Computer Science + 1 yr exp in job offered or as a Programmer required. Education or prior experience must include C/C++; COBOL ("Will also accept 3 year undergraduate degree in science or engineering + 1 yr experience in systems programming). 40 hrs/wk. 9am-5pm. \$55,000/yr. Must have proof of legal authority to work in the US. Send resumes to Nebraska Job Service, 550 South 16th Street, P.O. Box 94600, Lincoln, NE 68509. Ref#: NE 026777099165. An employer paid ad.

NETWORK CONSULTANTS

required. Electronics Engineer responsible for design, installation, configuration and testing of wide area network systems and gateway services for multiple servers and multiple network protocols.

Four years of experience required in the job duties described above. Must have proof of legal authority to work in the U.S.

Salary: \$90,000/year for a 40 hour work week.

Interested applicants should submit two (2) copies of his/her resume to Case #19983893, P.O. Box 8968, Boston, MA 02114. Ad paid by an Equal Opportunity Employer.

SYSTEMS ANALYST - In consulting environment meet with client management to assess requirements for the development of software systems to support a variety of applications. From requirements develop specifications. Provide analysis, design, development, testing, implementation, documentation & user support & training in a SAP environment. Reg B.S. in Quantitative discipline, A degree in any of following Comp. Sci, MIS, Computer Information Systems, Data Processing, Mathematics (incl Physics or Statistics), Engineering electrical, Electronic, Communication, Computer, Aeronautical, Civil acceptable, & 2 yrs exp. \$100,000/yr. 40hr/wk. Jobsite/Interv. Various locs in US. Send this ad and resume to Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, Florida 32302-0869. Job #FL-2059691.

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Progress 4GL, Progress 7.3, UNIX and C. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of Progress 4GL, Progress 7.3, UNIX and C. Salary: \$66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Anthony Gebicki, Westmoreland County CareerLink, 300 E. Hillis Street, Youngwood, PA 15697-1808, WEB92955.

Systems Analyst - (over 50% of time in Jacksonville, FL; bal. elsewhere) Analyze software/systems needs; enhance, modify software modules & applies in AS/400, RPG/400, CL/400 environment; test & provide quality assurance. Bachs/Comp Sci or Engg or Math. 2yrs/exp. in job offered. 40hrs/wk (9-6; M-F) \$45,000/yr. Send resume to: Dept. of Labor/Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302, ATT: L. Knight. Re: JO#FL-2073069.

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in ASP, Visual Basic, Crystal Reports and Oracle. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of ASP, Visual Basic, Crystal Reports and Oracle. Salary: \$66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Ms. Margaret Weckerly, Butler County Job Center, 227 West Cunningham Street, Butler, PA 16003, Job No. WEB92958.

Software Engineer. Design, develop and interface conversion and migration system using Oracle. Work in data gathering, data mapping, testing and reconciling before loading data into client/server database. Design and develop applications using Oracle reports using SOR and Crystal Reports. Demonstrated ability designing and developing applications using Oracle under Unix platform. Knowledge to design and develop applications using VB. \$75,000/yr. 40 hr/wk. 9 a.m. - 5 p.m. Must have 5 yrs. exp. (or 5 yrs. Exp. in related occupation of Sr. Analyst Programmer/Programmer Analyst) and B.S. in Comp. Sci., Eng., rel. field/equiv. Send 2 resumes: Case #19983821, P.O. Box 8968, Boston, MA 02114.

Sterlite Software USA, Inc., needs Software/Systems Engineers, Systems/Programmer/Business Analysts with a min. of 2 yrs. Exp. in either (A) or (B) or (C) or (D). (A): Unix Internals, Unix Dec Alpha Server, Oracle Reports 3.0, Matrix, SOL*PLUS, SOL*Functions, SOL*Loader; (B): HP-UX, AIX, Discoverer 3.1, SOL Navigator, PVCS, VSS, Appworx, Oracle Financials 10.7 SC; (C): PFC, Cornerstone, Smartstream, Web Powerbuilder, MS-COBAL, T-SOL, Watcom SOL, SOA Manager, SOL Navigator Pro; (D): Windows-NT, SCO UNIX 5.0.4, Visual Basic 6.0, ActiveX, COM/DCOM, ODBC, DAO, RDO, ADO. Travel reqd. Please send resume & salary reqmts. to HR, 111 South #2, Princeton Arms, Cranbury, NJ 08512.

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in AS/400, Query/400, RPG/400 and DB2/400. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and knowledge of AS/400, Query/400, RPG/400 and DB2/400. Salary: \$66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Tom Dembosky, Indiana Job Center, 350 N. Fourth Street, Indiana, PA 15701, Job No. WEB92951.

Programmer: Atlanta opening to design & develop computer system and programs on mid-range UNIX platform using C, Pro*C, SQL and Oracle Database. Also design and develop new features & functionality for products & services. Req. MS in Computer Science plus 6 mo. exp.

Resume to: Director, Kathy Beatty, Equifax, Inc. 1600 Peachtree St, N.W. Atlanta, GA 30309.

SOFTWARE ENGINEERS/CONSULTANTS

needed for analysis, design, programming, maintenance and documentation of applications software using NATURAL/ADABAS and NATURAL/DB2. Three years of experience required. Must have proof of legal authority to work in the U.S.

Salary: \$50.00/hour for a 40 hour work week.

Interested applicants send resume to: Case #19992116, P.O. Box 8968, Boston, MA 02114. Ad paid by an Equal Opportunity Employer.

SOFTWARE ENGINEER to design, develop, test, implement and maintain application software using object oriented programming, C++, C, Oracle, RDBMS, OTL, RogueWave tools.h++ and SCCS on Sun Solaris platforms. Require: M.S. degree (or equivalent) in Computer Science, an Engineering discipline, or a closely related field, with two years of experience in the job offered or as a Programmer/Analyst. A B.S. degree with five years of progressively responsible experience in the field will be considered equivalent to a M.S. degree. Extensive travel on assignments to various client sites within the U.S. is required. Salary: \$68,000/year; 9:00 am to 5:00 pm M-F. Send resume to: Juliette Moore, Director of Human Resources, Software Technical Services, 105 Nobel Court, Alpharetta, GA 30005; Attn: Job GS.

SOFTWARE ENGINEER (MULTIPLE OPENINGS)

Analyze, design, dvp., code, test & implement commercial apps utilizing in-depth knowledge of sys. dvpmt. life cycle. Dvp. designs based on specs. Analyze, evaluate & modify existing or proposed systems. Coordinate w/users to ensure effic. & timely delivery of systems. M.S. in Comp. Sci., Engrg. Business or Math or, alt., B.S. in Comp. Sci., Engrg. Business, or Math + 5 yrs. of progressively resp. exp. as Software Engr., Analyst Progr., Sys. Analyst or Software Consult. reqd. Must have working knowledge of either: (i) Cold Fusion, HTML, XML, Java & Oracle; or (ii) Sybase, Powerbuilder & Visual Basic. High mobility preferred. 40 hrs/wk, 8 a.m. - 5 p.m. \$70,000/yr. Qualified applicants report/submit resume to: Barbara Cole, Superv., Greene County Team PA Career Link, 4 West High St., Waynesburg, PA 15370. Refer to Job Order No. WEB92706.

SYSTEMS ENGINEER

needed for analysis, design, testing and modification of manufacturing and assembly systems software on mainframe platforms using Assembler coding, COBOL code generators, Oracle and DB2 databases and the mainframe's Information Management System (IMS) with its related database transaction monitor utilities for batch and real-time data communications. Bachelor's required in Math, Computers, Engineering or any other related field of study, plus 2 years of experience. Must have legal authority to work permanently in the U.S.

\$65,000/yr.; 40 hr. wk.

Submit resume to Jane Hosley, Ref. #1335, DES 275 E. Main St., 2-W, Frankfort, KY 40621. EOE

Programmer Analyst needed for software development and consulting firm located in Duluth, Georgia. Job duties include: Analyze, design, and develop software applications. Consult on various in-house projects and/or contract basis throughout the United States. Use BPCS software package, RPG/400, CL/400, SOL/400, Query/400, PDM, SEU, DBU, SDA, RLU, and DFU on IBM AS/400 machine. Applicant must have B.S. degree in Computer Engineering, or Computer Science. Applicant must also have 2 yrs. exp. in the job duties listed above or as a programmer analyst or consultant and which includes designing and developing computer applications using AS/400, RPG/400, and CL/400. 40hrs/wk., 8am-5pm, Mon-Fri, \$62,920/yr. Apply in person or send 2 resumes to: Georgia Department of Labor, Job Order #GA 6499662, 1535 Atkinson Rd, Lawrenceville, GA 30243-5601 or the nearest Department of Labor Field Service Office.

Web Author. Duties: Resp. for the day-to-day site design & creation and for all tech. aspects of web-sites for clients, incl. performance issues such as speed of access and for approving site content. Use HTML (Hyper Text Mark-Up Lang.) to focus primarily on files within an internet document root. Create & develop visually aesthetic graphics using 3D computer graphics animation & write text for web sites. Create links to other web-sites. Requires: Master's in Comp. Art or related field. Coursework must incl. classes in Computer Art & 3D Computer Concepts. Also requires 1 yr. exp. in the job offered or 1 yr. exp. as a Computer Graphics Animator or Web Designer. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary: \$45,000/yr. Send resume (no calls) to: Steve Thornton, CTG, Inc., 5295 Brook Hollow Pkwy, Suite 120, Norcross, GA 30071-3619. Must have legal auth. to work in U.S.

Engineering Sr. Software Engineer. Duties: Designs, implements documents & maintains complex systems & applications programming interfaces; identifies enhanced or replacement processes to achieve objectives; determine approach, design implement for unit tests for product components; designs conceptual approaches, coding & debugging; highlights exceptions to the plan, identifying actions being taken to address the exceptions; responsible for the quality of technical education in the company by teaching courses, providing technical training, constructing curriculum or instructional plans for courses, preparing white papers or obtaining patents. Reqs: MS in CS, EE or related field & 1 yr exp in job offered or in software design, development/programming. 40+ hrs/wk, Salary \$82,400/yr. Job location & interview: Concord, MA. If interested, please respond to Case #19990032, PO Box 8968, Boston, MA 02114.

SENIOR PROGRAMMER/ANALYST

to analyze, design, develop, maintain, test and debug new and existing modules for real-time telecommunication software applications using Visual Basic, C, C++, relational database such as MS Access and IPC mechanisms in a client/server environment on Windows NT platform; Convert and move data between AS/400 flat files written in RPG and CL and MS Access; Analyze and rewrite program code originally written in COBOL and Easytrieve for mainframe computers into RPG or CL programs for the AS/400. Require: B.S. degree in Computer Science, Information Systems, or a closely related field with 2 years of experience in the job offered or as a Programmer/Analyst. Salary: \$63,000 per year, 8:30 am to 5:30 pm, M-F. Send resume to: Linda Young, Employment Manager, Direct Administration, Inc., 1281 Murfreesboro Rd., Nashville, TN 37217; Attn: Job HI.

Systems Administrators

Brookhaven National Laboratory is seeking computer professionals for various opportunities within their Information Technology Division.

NT System Administrator

Responsibilities include hardware/software setup, administration, maintenance, database configuration and end-user report development. A Bachelor's degree in Computer Science or equivalent, a minimum 5 years' NT-based administration, TCP/IP and local area experience are required. Knowledge of T1based external communication links for critical business applications, Microsoft Exchange, Office, Excel, Access, and Crystal Report generation and NT certification are a must. SOL, VB, HTML and application programming ability, along with VPN experience, is a plus.

UNIX System Administrator

You will manage systems and provide end-user support in a large, heterogeneous environment. A Bachelor's degree in Computer Science or equivalent, a minimum 5 years' experience administering UNIX systems in a production environment, knowledge of TCP/IP networking as it relates to system network interactions and certification in Solaris and/or Linux are essential. Working knowledge of common tools used to remotely administer systems and scripting languages such as Bourne Shell, Perl, NIS are necessary. Background with C and/or Java and other UNIX flavors and secure access via ssh and Kerberos are a plus.

UNIX System Administration and Computer Security Analyst

Investigating the Kerberos authentication system, you will configure and maintain Linux-based application proxy servers and work with intrusion detection reporting and analysis. A Bachelor's degree, 5 years' experience with UNIX System Administration (Solaris and/or Linux), advanced knowledge of programming (C or Java) and/or scripting (Visual Basic, Perl, Python) languages and an understanding of TCP/IP networking and related security issues are required. A background with Windows NT and Enterprise Management Systems such as CA, TNG or HP Openview are preferred.

Remote Access Administration and Computer Security Analyst

Providing Virtual Private Network client and server management, deployment or remote intrusion detection agents, you will report on and analyze the intrusion detection system. A Bachelor's degree, 3-5 years' experience with a Windows NT System Administration in a large scale environment, knowledge of Visual Basic and Perl, and an understanding of TCP/IP networking and related security issues are required. A background with Enterprise Management Systems such as CA, TNG or HP Openview is a plus.

Brookhaven offers a stimulating work environment and a comprehensive benefits package. For consideration, please forward your resume indicating position to: Nancy L. Sobrito, Brookhaven National Laboratory, Bldg. 185-HR, Upton, NY 11973; Fax: 631-344-7170; E-mail: Sobrito@bnl.gov. Visit our website: www.bnl.gov. BNL is an equal opportunity employer committed to workforce diversity.

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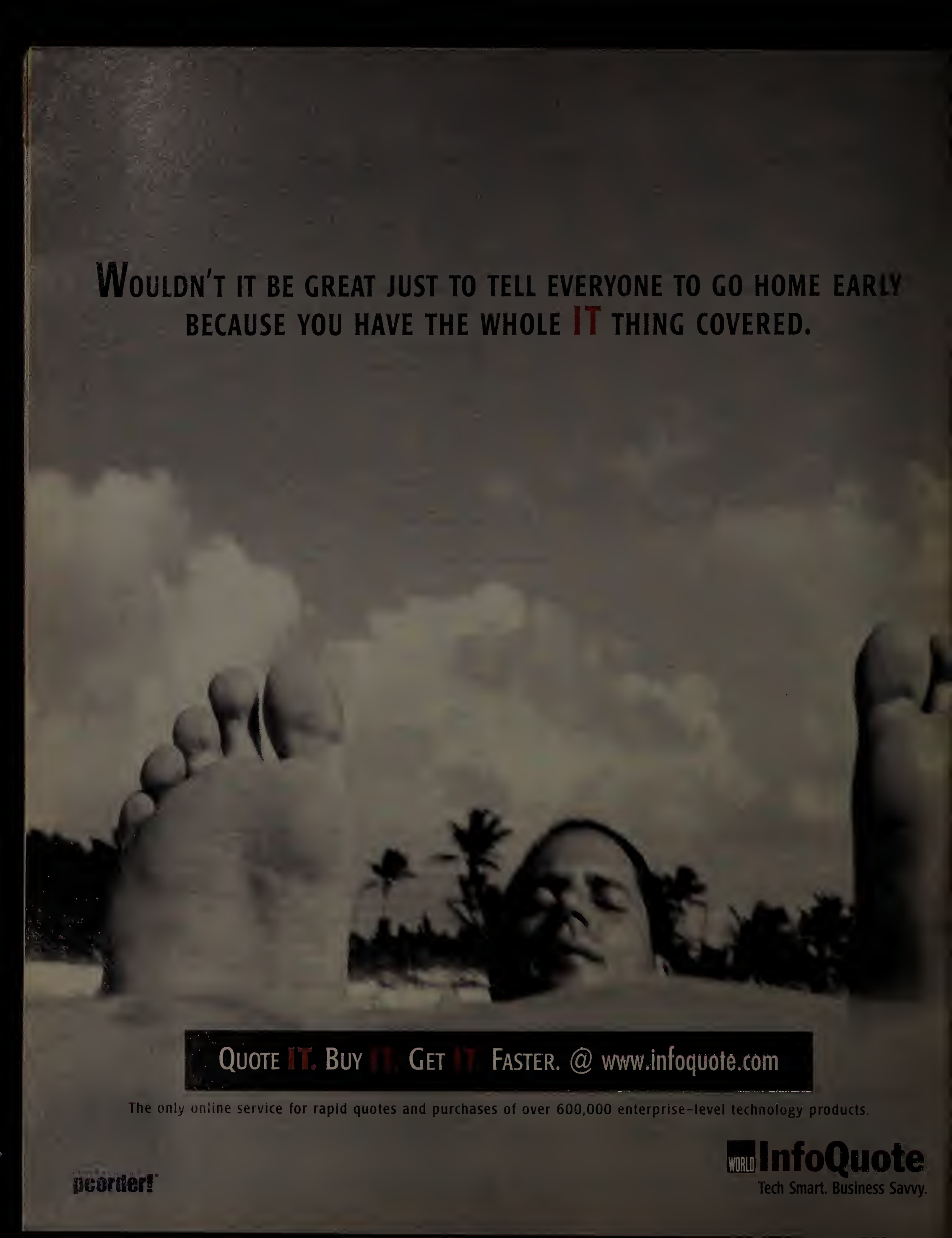
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GAINERS ↑

PERCENT

| | |
|------------------------|------|
| Shared Medical Systems | 69.5 |
| Network Computing Dev | 37.0 |
| Open Market, Inc. | 27.7 |
| Sybase Inc. | 27.6 |
| Sapient Corp. | 26.7 |
| Newbridge Networks (H) | 20.2 |
| Informatica Corp. | 20.1 |
| Mentor Graphics | 16.7 |

DOLLAR

| | |
|--------------------------------|-------|
| Shared Medical Systems | 29.19 |
| Sapient Corp. | 21.13 |
| SGS-Thomson Microelectronics | 14.50 |
| Informatica Corp. | 8.06 |
| Newbridge Networks (H) | 7.19 |
| Checkpoint Software Tech. Ltd. | 6.75 |
| Nextel Communications | 6.63 |
| Hitachi Ltd. | 5.88 |

LOSERS ↓

PERCENT

| | |
|---------------------------|-------|
| Novell Inc. (L) | -43.0 |
| Baan Co. N.V. (L) | -29.6 |
| Renaissance Worldwide (L) | -28.6 |
| Sollectron Corp. | -27.0 |
| Citrix Systems Inc. | -25.1 |
| Westell Technology Inc. | -21.2 |
| Legato Systems Inc. | -20.3 |
| Adaptec Inc. | -20.0 |

DOLLAR

| | |
|-----------------------------------|--------|
| Juniper Networks Inc. | -27.75 |
| eBay Inc. | -22.13 |
| Lexmark International Group, Inc. | -15.44 |
| Citrix Systems Inc. | -14.88 |
| Sollectron Corp. | -12.69 |
| Texas Instruments | -11.81 |
| Apple Computer Inc. | -10.13 |
| Motorola | -10.06 |

Analysts: Sybase Stock Is Undervalued

Web products expected to help increase value

BY CHRISTINE MCGEEVER

AMONG DATABASE vendors, Sybase Inc. [Nasdaq:SYBS] is perceived to be a minor player. Compared with competitors such as Oracle Corp. [Nasdaq:ORCL], IBM [NYSE:IBM], Microsoft Corp. [Nasdaq:MSFT] and Informix Corp. [Nasdaq:IFMX], Sybase had the smallest share of new-license revenue last year, at 3.6%. In contrast, market leader Oracle's rate was 30.7%, according to Stamford, Conn.-based Gartner Group Inc.

But analysts said market numbers

don't tell the whole story for Sybase.

The company is profitable, has a loyal customer base and this month will announce offerings in the Internet portal and wireless computing arenas. The Emeryville, Calif.-based company also promises high availability, good application integration and data management features for its Enterprise Portal Web-based server, for example. Thus, at about \$22, the company's stock is undervalued, analysts said.

On April 18, Sybase announced very strong first-quarter earnings. Net income grew 129% to \$6.7 million. Total revenue grew 9% to \$227 million.

In its latest quarter, Oracle, which is trading in the high \$70s, posted net income slightly more than double Sybase's. Oracle netted \$763 million on revenue of \$1 billion in its latest quarter, up 160% from the same period last year.

A Good Place

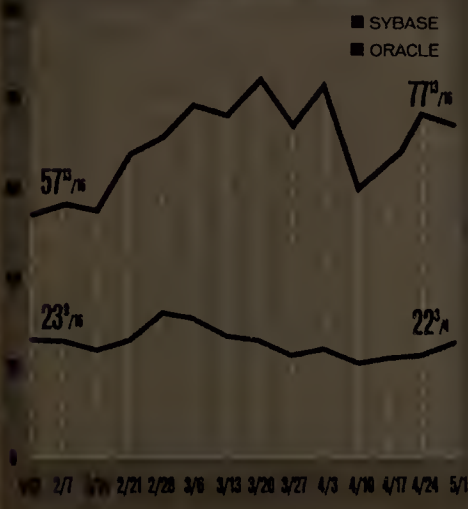
According to Gary Abbot, an analyst at Punk, Ziegel & Co. in New York, Sybase is in a very good strategic position against Oracle and IBM, largely because the company has had great success selling both applications and database engines into vertical markets—notably, Wall Street. Abbot said about 70% of Wall Street stock trades happen on Sybase software.

Sybase's closest competitor on Wall Street, he added, is the formidable IBM, which announced last month that it had stolen J. P. Morgan and Co. [NYSE:JPM] in New York and other unnamed customers.

However, "I don't see Sybase losing market share," Abbot said. "They have a stable customer base."

Undervalued?

Analysts say Sybase's stock may be significantly undervalued, especially compared with rival Oracle's.



SOFTWARE OFF -2.4%

| EXCH | 52-WEEK RANGE | MAY 5 2 PM | WK NET CHANGE | WK PCT CHANGE |
|-------|---------------|------------|--------------------------------|--------------------|
| ASWX | 149.12 | 11.00 | Active Software (H) | 36.38 -6.13 -14.4 |
| ADBE | 131.00 | 30.81 | Adobe Systems Inc. (H) | 117.00 8.50 6.8 |
| ARBA | 183.34 | 15.25 | Ariba Inc. | 78.13 4.13 5.6 |
| AZPN | 55.37 | 8.12 | Aspen Technology Inc. | 36.00 -0.89 -1.9 |
| AOSK | 56.06 | 17.00 | Autodesk Inc. | 37.00 -1.38 -3.6 |
| AVID | 25.56 | 9.43 | Avid Technology | 12.69 -0.25 -1.9 |
| BAANF | 17.81 | 2.00 | Baan Co. N.V. (L) | 2.38 -1.00 -29.6 |
| BMCS | 86.62 | 36.00 | BMC Software Inc. | 44.38 -2.44 -5.2 |
| 8DBJ | 150.87 | 11.06 | Business Objects S.A. | 93.25 -5.31 -5.4 |
| CON | 24.62 | 9.18 | Cadence Design Systems | 18.38 1.38 8.1 |
| CHKP | 295.00 | 16.62 | Checkpoint Software Tech. Ltd. | 186.00 6.75 3.8 |
| CTXS | 122.31 | 20.18 | Citrix Systems Inc. | 44.50 -14.88 -25.1 |
| COGN | 41.12 | 9.68 | Cognos Inc. (L) | 37.06 0.00 0.0 |
| CA | 79.43 | 40.93 | Computer Associates Int'l Inc. | 53.31 -2.81 -5.0 |
| CPWR | 40.00 | 10.43 | Compware Corp. | 11.38 -1.28 -10.1 |
| DCIM | 106.00 | 12.18 | Docuementum | 56.38 -6.38 -10.2 |
| EFII | 69.31 | 35.00 | Electronics For Imaging | 53.63 1.19 2.3 |
| HNCS | 130.00 | 18.00 | Hnc Software | 45.63 0.00 0.0 |
| HYSL | 65.00 | 12.00 | Hyperion Software | 29.13 -0.31 -1.1 |
| IDXC | 49.12 | 15.31 | IDX Systems | 19.88 2.75 16.1 |
| INFA | 110.87 | 9.50 | Informatica Corp. | 48.13 8.06 20.1 |
| IFMX | 21.25 | 6.03 | Informix Software Inc. | 10.13 -0.56 -5.3 |
| INTU | 90.00 | 22.50 | Intuit | 34.50 -2.88 -7.7 |
| JKHY | 41.31 | 15.50 | Jack Henry Associates | 39.09 -1.53 -3.8 |
| JOEC | 48.31 | 11.56 | J.D. Edwards & Co. | 14.88 -2.25 -13.1 |
| LGTE | 82.50 | 10.50 | Legato Systems Inc. | 12.75 -3.25 -20.3 |
| MACR | 100.00 | 27.37 | Macromedia Inc. | 86.88 -0.25 -0.3 |
| MANU | 70.25 | 7.50 | Manugistics Group Inc. | 36.50 -6.88 -15.9 |
| MENT | 18.50 | 7.75 | Mentor Graphics | 15.25 2.19 16.7 |
| MSFT | 119.93 | 65.00 | Microsoft Corp. | 71.31 2.56 3.7 |
| NETA | 37.18 | 11.62 | Network Associates | 25.81 0.00 0.0 |
| GMH | 140.00 | 48.75 | Network General | 89.31 -6.88 -7.1 |
| NOVL | 44.56 | 10.43 | Novell Inc. (L) | 11.00 -8.31 -43.0 |
| ORCL | 90.00 | 11.28 | Oracle Corp. | 75.75 -3.81 -4.8 |
| PMTC | 35.93 | 7.37 | Parametric Technology Corp. | 8.78 0.66 8.1 |
| PSFT | 27.75 | 12.62 | PeopleSoft Inc. | 14.00 -0.44 -3.0 |
| PIXR | 50.62 | 33.12 | Pixar | 37.81 0.81 2.2 |
| RATL | 105.00 | 26.37 | Rational Software Corp. | 84.13 -1.13 -1.3 |
| RHAT | 151.31 | 7.00 | Red Hat Inc. | 25.38 -0.13 -0.5 |
| QST | 98.12 | 7.00 | Quest Software | 42.00 5.19 14.1 |
| SAP | 85.93 | 29.37 | SAP AG | 49.94 1.00 2.0 |
| SCUR | 29.62 | 2.25 | Secure Computing Corp. | 13.75 0.50 3.8 |
| SDRC | 23.43 | 8.81 | Structural Dynamics Research | 12.38 -0.63 -4.8 |
| SYBS | 31.00 | 7.12 | Sybase Inc. | 24.88 5.38 27.6 |
| SYMC | 81.82 | 17.75 | Symantec Corp. | 61.56 1.00 1.7 |
| SNP5 | 75.62 | 36.87 | Synopsis | 40.06 -3.31 -7.6 |
| 5CTC | 28.37 | 10.00 | Systems & Computer Technology | 22.63 -0.38 -1.6 |
| TIBX | 147.00 | 5.00 | Tibco Software Inc. | 84.69 -4.31 -4.8 |
| TSAI | 48.12 | 12.75 | Transaction Sys. Architects | 17.19 1.69 10.9 |
| VRTS | 174.00 | 15.05 | Veritas Software Corp. | 97.44 -9.63 -9.1 |
| WIND | 66.12 | 13.37 | Wind River Systems Inc. | 39.94 -3.06 -7.0 |

TELECOMMUNICATIONS CARRIERS OFF -3.4%

| EXCH | 52-WEEK RANGE | MAY 5 2 PM | WK NET CHANGE | WK PCT CHANGE |
|-------|---------------|------------|-----------------------------|-------------------|
| AT | 91.81 | 55.87 | Alltel Corp. | 64.88 -1.50 -2.3 |
| ANOW | 31.25 | 11.18 | Andrew Corp. | 28.00 -1.31 -4.5 |
| T | 63.00 | 37.62 | AT&T (L) | 39.00 -7.94 -16.9 |
| BCE | 137.50 | 44.93 | BCE Inc. | 118.00 0.44 0.4 |
| BEL | 69.50 | 47.37 | Bell Atlantic | 54.13 5.44 -9.1 |
| BLS | 53.50 | 34.93 | Bell South | 45.81 -2.75 -5.7 |
| BRW | 41.06 | 16.31 | Cincinnati Bell Inc. | 28.75 1.89 6.2 |
| CMCSK | 57.68 | 31.56 | Comcast | 35.00 -5.25 -13.0 |
| CQ | 37.06 | 15.37 | Comsat Corp. | 25.06 0.56 2.3 |
| CDX | 58.37 | 33.37 | Cox Communications Inc. | 38.31 -4.58 -10.6 |
| GSTRF | 53.75 | 7.87 | Globalstar Telecom. Ltd. | 10.25 -1.63 -13.7 |
| GTE | 78.50 | 55.81 | GTE Corp. | 64.38 -5.63 -8.0 |
| NXTL | 165.87 | 33.00 | Nitel Communications | 116.50 6.63 6.0 |
| SPDT | 74.25 | 29.00 | Panamsat | 38.81 -2.69 -6.5 |
| QCOM | 200.00 | 21.51 | Qualcomm | 109.50 1.63 1.5 |
| 5BC | 59.87 | 34.81 | SBC Communications | 42.81 -1.38 -3.1 |
| FDN | 75.93 | 42.62 | Sprint Corp. | 60.69 -1.00 -1.6 |
| TDS | 137.00 | 59.75 | Telephone and Data Systems | 104.75 2.31 2.3 |
| USW | 81.50 | 51.50 | US West | 72.50 0.25 0.3 |
| VIA | 63.31 | 36.68 | Viacom | 55.94 1.31 2.4 |
| WCIL | 66.50 | 24.00 | Winstar Communications Inc. | 40.94 1.06 2.7 |
| WCOM | 64.51 | 37.75 | MCI Worldcom Inc. | 43.75 -1.38 -3.0 |

SERVICES UP 2.3%

| EXCH | 52-WEEK RANGE | MAY 5 2 PM | WK NET CHANGE | WK PCT CHANGE |
|------|---------------|------------|-------------------------------|-------------------|
| ACXM | 35.93 | 14.56 | Axiom Corp. | 30.38 3.06 11.2 |
| ACS | 53.00 | 31.00 | Altitude Computer Servs | 36.38 3.38 10.2 |
| AM5Y | 44.37 | 19.75 | American Mgt. Systems | 35.88 -0.56 -1.5 |
| AUD | 56.00 | 37.37 | Automatic Data Processing (H) | 51.88 -2.63 -4.8 |
| BSYS | 69.00 | 41.37 | Bisys Group Inc. | 62.50 0.44 0.7 |
| CATP | 27.00 | 8.81 | Cambridge Technology Ptnrs | 10.00 -1.00 -9.1 |
| CEN | 36.87 | 14.75 | Ceridian | 22.13 0.00 0.0 |
| CBR | 29.81 | 13.75 | Ciber Inc. | 18.38 0.31 1.7 |
| CDO | 57.25 | 17.43 | Comdisco | 31.63 0.25 0.8 |
| CHRX | 27.12 | 10.37 | Computer Horizons Corp. | 13.13 -0.75 -5.4 |
| CSC | 94.93 | 57.31 | Computer Sciences | 79.25 -2.00 -2.5 |
| DST | 76.43 | 51.18 | Dsl Systems Inc. | 73.69 -0.50 -0.7 |
| EOS | 76.68 | 47.87 | Electronic Data Systems | 61.63 -6.38 -9.4 |
| FOC | 54.25 | 38.93 | First Data Group | 48.56 -1.06 -2.1 |
| FISV | 46.81 | 24.12 | Fiserv (H) | 46.00 0.88 1.9 |
| IT | 24.93 | 9.56 | Gartner Group | 13.63 0.19 1.4 |
| KEA | 35.00 | 18.06 | Keane | 28.44 -0.44 -1.5 |
| NOC | 52.06 | 21.75 | National Data | 27.13 -0.56 -2.0 |
| PAYX | 57.37 | 23.56 | Paychex Inc. (H) | 47.63 -3.75 -7.3 |
| PER | 33.62 | 15.31 | Perot Systems Corp. | 17.44 1.13 6.9 |
| REGI | 9.75 | 2.25 | Renaissance Worldwide (L) | 2.81 -1.13 -28.6 |
| REY | 33.00 | 17.75 | Reynolds & Reynolds | 25.75 1.69 7.0 |
| SFE | 99.00 | 15.85 | Satgard Scientifics | 44.75 2.25 5.3 |
| SAPE | 151.18 | 23.87 | Sapient Corp. | 100.13 21.13 26.7 |
| 5MS | 73.50 | 35.50 | Shared Medical Systems | 71.19 29.19 69.5 |
| 5DS | 40.00 | 16.87 | Sungard Data Systems | 32.69 -2.06 -5.9 |
| SYNT | 20.93 | 7.75 | Syntel Inc. | 12.00 1.13 10.3 |
| TECO | 44.88 | 18.00 | Tech Data | 41.38 1.44 3.4 |
| TENF | 76.87 | 17.00 | TenFold Corp. | 24.38 1.75 6.7 |
| TSS | 20.62 | 14.12 | Total System Services Inc. | 19.75 0.25 1.3 |
| TSAT | 48.12 | 12.75 | Transaction Sys. Architects | 17.19 1.69 10.9 |

NETWORK UP 1.6%

| EXCH | 52-WEEK RANGE | MAY 5 2 PM | WK NET CHANGE | WK PCT CHANGE |
|-------|---------------|------------|---------------------------------|-------------------|
| CDMS | 119.75 | 22.62 | 3Com Corp. | 43.13 4.25 10.9 |
| ADCT | 64.50 | 17.18 | ADC Telecommunications Inc. (H) | 62.69 2.56 4.3 |
| ANIC | 61.25 | 23.25 | Antec | 51.81 -0.19 -0.4 |
| BNYN | 40.56 | 6.25 | Banyan Systems Inc. | 13.50 -0.13 -0.9 |
| CS | 52.75 | 8.50 | Cabletron Systems | 26.25 2.81 12.0 |
| CNEBF | 8.00 | 2.87 | Call-Net Enterprises | 3.81 0.19 5.2 |
| CSCO | 82.00 | 25.93 | Cisco Systems Inc. | 87.50 2.00 2.9 |
| ECIL | 39.43 | 23.75 | ECI Telecom | 28.19 0.19 0.7 |
| ENTU | 150.00 | 16.87 | Entrust Technologies Inc. | 53.94 4.94 10.1 |
| HRS | 40.62 | 15.50 | Harris Corp. | 35.31 3.50 11.0 |
| GMH | 140.00 | 48.75 | Hughes Electronics/GM | 89.31 6.88 7.1 |
| ERIC | 105.25 | 26.37 | LM Ericsson | 87.81 -2.06 -2.3 |
| JNPR | 312.93 | 11.33 | Juniper Networks Inc. | 192.25 27.75 12.6 |
| LU | 84.18 | 49.81 | Lucent Technologies | 59.50 -3.94 -6.2 |
| MADGF | 17.37 | 1.43 | Madge Networks | 4.88 0.63 11.4 |
| NCOI | 9.62 | 1.31 | Network Computing Dev | 2.31 0.63 37.0 |

SEMICONDUCTORS, CHIPS & EQUIPMENT OFF -5.8%

| EXCH | 52-WEEK RANGE | MAY 5 2 PM | WK NET CHANGE | WK PCT CHANGE |
|------|---------------|------------|------------------------------|-------------------|
| NWK | 14.81 | 7.68 | Network Equipment Tech. | 8.06 0.38 4.4 |
| NN | 42.75 | 14.00 | Newbridge Networks (H) | 42.75 7.19 20.2 |
| NOK | 60.00 | 18.92 | Nokia Corp. (H) | 56.13 1.00 1.8 |
| NT | 144.18 | 33.28 | Northern Telecom Ltd. | 115.44 -1.25 -1.1 |
| PAIR | 26.25 | 8.00 | Pargam Technologies Inc. (H) | 25.75 1.19 4.8 |
| PCTL | 15.21 | 2.75 | Pictetel | 4.25 -0.13 -2.9 |
| SFA | 77.00 | 15.84 | Scientific Atlanta | 66.50 0.00 0.0 |
| TLAB | 77.25 | 41.81 | Tellabs Inc. | 49.50 -5.38 -9.8 |
| USW | 81.50 | 51.50 | US West | 72.50 0.25 0.3 |
| VRK | 22.00 | 1.81 | Veritalk | 9.56 1.06 12.5 |
| WSTL | 40.75 | 5.50 | Westell Technology Inc. | 22.94 6.19 21.2 |

COMPUTER SYSTEMS OFF -4.3%

| EXCH | 52-WEEK RANGE | MAY 5 2 PM | WK NET CHANGE | WK PCT CHANGE |
|-------|---------------|------------|----------------------------|--------------------|
| AAPL | 150.37 | 40.93 | Apple Computer Inc. | 113.88 -10.13 -8.2 |
| ASPX | 19.00 | 3.87 | Auspex Systems | 7.31 -0.50 -6.4 |
| 8EOS | 39.56 | 3.28 | Be Inc. | 7.63 -0.25 -3.2 |
| CPQ | 34.00 | 18.25 | Compaq | 27.19 -2.31 -7.8 |
| DELL | 59.68 | 31.37 | Dell Computer Corp. | 49.06 -1.06 -2.1 |
| GTW | 84.00 | 28.37 | Gateway 2000 Inc. | 53.06 -3.19 -5.7 |
| HWP | 155.50 | 67.00 | Hewlett-Packard Co. | 137.00 0.13 0.1 |
| HIT | 164.50 | 67.00 | Hitachi Ltd. | 129.63 5.88 4.7 |
| IBM | 139.18 | 89.00 | IBM | 107.94 -3.19 -2.9 |
| MUEI | 20.68 | 9.00 | Micron | 10.13 -0.63 -5.8 |
| MDT | 184.62 | 76.18 | Motorola | 110.50 -10.06 -8.3 |
| NATI | 59.50 | 21.50 | National Instruments Corp. | 45.75 -2.25 -4.7 |
| NCR | 52.62 | 26.68 | NCR | 35.81 -2.88 -7.4 |
| NIPNY | 149.50 | 53.18 | NEC | 142.63 5.75 4.2 |
| PRCM | 89.75 | 3.43 | Procom Tech Inc. | 30.31 -4.94 -14.0 |
| SGI | 18.87 | 6.87 | Silicon Graphics Inc. | 7.06 -0.19 -2.6 |
| SNE | 314.75 | 89.25 | Sony | 221.50 -7.69 -3.4 |
| SUNW | 106.75 | 26.96 | Sun Microsystems | 89.63 -2.69 -2.9 |
| TRCD | 22.75 | 1.53 | Tricord Systems | 10.88 -1.50 -12.1 |
| UIS | 49.68 | 19.50 | Unisys | 24.06 0.63 2.7 |

INTERNET OFF -0.6%

| | | | | | | |
|------|--------|-------|--------------------------|--------|--------|-------|
| AMZN | 113.00 | 40.81 | Amazon.com | 57.81 | 3.06 | 5.6 |
| AOL | 95.81 | 38.46 | America Online | 58.88 | -3.38 | -5.6 |
| ATHM | 83.12 | 15.87 | @home Corp. | 17.75 | 0.88 | -4.7 |
| CKFR | 125.62 | 23.12 | Checkfree | 50.69 | -1.06 | 2.1 |
| CYCH | 17.68 | 6.56 | Cybercash Inc. | 7.50 | 3.38 | -4.8 |
| EBAY | 255.00 | 70.28 | eBay Inc. | 135.75 | -22.13 | 14.0 |
| ETYS | 86.00 | 4.50 | eToys Inc. | 6.91 | -1.03 | 13.0 |
| EGRP | 60.43 | 16.06 | ETrade Group Inc. | 20.06 | -1.75 | -8.0 |
| LCDS | 93.62 | 28.56 | Lycos Inc. | 49.81 | 3.81 | 8.3 |
| OMKT | 65.50 | 7.87 | Open Market Inc. | 12.89 | 2.75 | 27.7 |
| OTEX | 60.62 | 9.50 | Open Text Corp. | 23.06 | -0.81 | -3.4 |
| PCLN | 158.87 | 45.50 | Priceline.com Inc. | 57.88 | -7.44 | -11.1 |
| PRGY | 35.43 | 8.25 | Prodigy Communications | 12.00 | 0.75 | 6.7 |
| PSIX | 60.93 | 15.53 | PSiNet Inc. | 21.81 | 0.56 | 2.6 |
| RSAS | 93.06 | 15.87 | Security Dynamics | 60.00 | 0.00 | 0.0 |
| SPYG | 25.25 | 9.68 | Spypglass Inc. | 5.02 | -2.13 | -3.9 |
| WINK | 75.00 | 6.00 | Wink Communications Inc. | 24.94 | 2.63 | 11.8 |
| YHOO | 250.66 | 55.00 | Yahoo Inc. | 125.38 | -3.31 | 2.6 |

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'Love Bug'

systems — couldn't be quantified. But it showed once again the vulnerability of systems connected by the Internet and the reliance of business globally on e-mail.

"As long as we are intent on connecting to the Internet and using e-mail to communicate, there are going to be opportunities for crackers to go in and insert malicious code," said Tanya Candia, vice president of worldwide marketing at F-Secure Corp., a security software vendor in Espoo, Finland. F-Secure claimed to have discovered the virus.

"We have built a worldwide network that lets us find out about incidents and come up with a fix, but there is always going to be some kind of lag," she said.

Internet security firm ICISA.net estimated that the worm had infected more than 1 million computers. Organizations hit included thousands of large companies, the U.S. Department of Defense agencies and Congress. It caused e-mail servers to be shut down at AT&T Corp., the Jet Propulsion Laboratory in Pasadena, Calif., Ford Motor Co., Philips Customer Call Center and The Walt Disney Co.

Antivirus companies, most of which offered no defense against the virus until its signature was discovered, found themselves swamped by anxious users. Web servers at antivirus companies such as Computer Associates International Inc. in Islandia, N.Y., and Symantec Corp. in Cupertino, Calif., were bogged down, preventing users from downloading fixes from the sites.

The virus, a Visual Basic software script, targets Microsoft Corp.'s Outlook e-mail program, automatically sending messages with the virus to everyone in the address book of the infected user. Microsoft said Outlook users can protect themselves by simply not opening the messages.

The virus also contained a Trojan Horse program that

sent the cached Windows passwords of unsuspecting recipients to an e-mail account in the Philippines. It had the ability to steal passwords to dial-up Internet services.

Microsoft insisted that any passwords downloaded would have been encrypted and therefore that any theft presented no risk to users.

Where controlling the virus was concerned, forewarned was forearmed.

At Xerox Corp. in Rochester, N.Y., workers were able to contain thousands of infected messages to the server because European colleagues alerted them to the virus at 5 a.m.

By the time normal business hours started, spokeswoman Christa Carone said, Xerox had purged the server and installed updates to its McAfee antivirus software. The company also alerted staff via voice mail, e-mail and notices on the company's public-address system.

"These efforts helped us,

and there were no confirmed reports of damage to the system [that were] related to the virus," Carone said. The virus, which was reported in more than 20 countries, spread via e-mail, Internet Relay Chat and shared file systems. In infected e-mail messages, the subject line read "ILOVEYOU."

To avoid further infections, Candia said, IT managers should tell all company employees to delete virus-laden e-mails not only from their inboxes but also from their deleted-file folders to ensure they aren't mistakenly opened later (see tips at right).

Software vendors stepped forward after the virus appeared to suggest that tools already exist to protect against "I Love You" and related threats.

W. Quinn Associates Inc. in Reston, Va., sells FileScreen 2000 for \$195 per server to allow an administrator to prevent Visual Basic Scripts and other executables from being

stored to a print, mail or file server.

"Unless your company has software developers, you have no real reason to store Visual Basic script, so you could just bar that with our product," said Steven Toole, marketing director at W. Quinn.

A variation of the "I Love You" virus, called VeryFunny.vbs, emerged later last week and hit companies including International Data Corp. in Framingham, Mass., and Zona Research Inc. in Redwood City, Calif. The variation may defeat new antivirus provisions if it includes a significantly different signature from that of the original virus. ■

What to Do

Security experts advise taking the following measures to protect against the Love worm:

- Avoid clicking on e-mail attachments and shared files.
- Update antivirus software and halt the virus by disabling active scripting in Internet Explorer and e-mail programs.
- Internet Relay Chat users should disable the automatic receiving of files via the Direct Cable Connection file-sharing mechanism.
- The virus variation, which includes the subject line "fwd: Joke," can potentially be kept at bay by other technologies such as the MIMESweeper product from Content Technologies Inc. in Bellevue, Wash. These technologies let users scan for certain words in the subject line of an e-mail and block those messages until an antivirus update can be installed.
- Systems administrators could protect against similar attacks by setting their Exchange servers to block all attachments written in Visual Basic script.
- Infected users should take care to change passwords that may have been compromised. The presence of files named MSKernal132.vbs and Win32DLL.vbs indicate that a system has been infected. — Ann Harrison

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New Weapons

much as the ability to rapidly defeat" an attack, said Fred Cohen, president of Fred Cohen & Associates, a security consultancy in Livermore, Calif.

The Computer Emergency Response Team (CERT), a group at Pittsburgh-based Carnegie Mellon University that monitors security issues, last week issued a warning about a tool called mstream, which a few sites found late last month.

An analysis of the tool shows it to be buggy and still in the development phase, according to a report published by David Dittrich, a computer administrator at the University of Washington in Seattle.

But it's still capable of producing "a severe denial-of-service condition against one or more victim sites," warned the CERT bulletin.

Distributed denial-of-service attacks seek to cripple a Web server by flooding it with thousands of simultaneous messages from computers that

have been tricked into launching them. Such attacks were launched against several heavily trafficked Web sites such as Yahoo Inc., eBay Inc., CNN.com, Buy.com Inc. and Amazon.com Inc. in February.

In each case, the sites were targeted with a massive volume of forged messages that overwhelmed servers and blocked out legitimate traffic for several hours.

Apart from the business disruption caused by such outages, another danger is that hackers could use a distributed denial-of-service attack as a diversion to infiltrate enterprise networks with even more malicious code, warned Harry DeMaio, president of Deloitte & Touche Security



THE HARTFORD'S Bob McKee: Making it as difficult as possible

Services LLC in Deerfield, Ill.

Currently, there is no easy defense against the attacks, because the barrage of traffic comes from thousands of computers, analysts said.

"The objective, therefore, is to make it as difficult as possible" for someone to carry out and sustain a distributed denial-of-service attack, said Bob McKee, vice president of system security at The Hartford Life Insurance Co. in Hartford, Conn.

Hartford has installed new software for boosting its network's intrusion-detection capabilities. The company also installed technologies for quickly identifying and filtering out suspicious Internet traffic from its networks. Hartford is in constant communication with its Internet service provider to make sure it remains on top of things, McKee said.

"It is the same rationale you use when putting in a good auto or home security system," said Josh Turiel, network service manager at Holyoke Mutual Insurance Co. in Salem, Mass.

Such technologies won't "stop a really determined person from getting into your sys-

tems, but it will keep a majority of amateurs away," Turiel said.

Also crucial is the need to have multiple incoming paths for Web traffic and mirror sites to which traffic can be quickly diverted if a primary server comes under attack, DeMaio said.

This means, for example, that companies should have domain name servers planted across the Internet so that when one server gets hit, they can quickly switch to another, said Cohen. Similarly, having multiple Internet service providers hooked up to a site, in addition to having standby servers, will allow a user to rapidly shift loads when under attack, he said.

Corporations should also make sure their servers don't become part of a distributed denial-of-service attack, said Ira Winkler, president of the Internet Security Advisors Group in Severna Park, Md.

That means keeping in constant touch with your service provider and ensuring that filters are put in place to prevent IP address forgery and to block traffic from places that allow forgeries, Winkler said. ■



FRANK HAYES/FRANKLY SPEAKING

Monopoly 101

YOU CAN LEARN A LOT about monopolies just by reading the news. Example: Last week, the U.S. government uncrippled the Global Positioning System for civilian use. As of Tuesday, business users with GPS devices won't get their locations just to within 100 meters; now the GPS can pinpoint it to within 10 meters. And sometimes less — *Computerworld* reporter Bob Brewin found some users who now get locations accurate to within 2 meters.

That accuracy used to be available only to the military. Now, we can get it too — for tracking deliveries, locating vehicles and finding our way. And, of course, the better-than-ever GPS signals are still free.

The move isn't all altruism. The satellite-based GPS system is completely controlled by the Department of Defense — it's a de facto monopoly. The European Union proposed its own competing GPS-like system, called Galileo, because the nonmilitary GPS signals were so inaccurate. But now that sounds unnecessarily and expensively redundant, doesn't it?

Of course, the U.S. still has the exclusive ability to jam the accurate GPS signals in times of war or, well, whenever that seems like the right thing to do.

Call it an object lesson in monopoly. The monopolist is willing to deliver this service for free, and even to enhance it, in order to maintain its monopoly — just in case that monopoly control someday comes in handy.

Also last Tuesday, Time Warner Cable ended (or at least suspended) its own exercise in monopoly power. Time Warner had stopped carrying ABC channels in New York, Los Angeles and several other cities — right in the middle of the spring ratings sweeps period, when ad rates are set.

Time Warner claimed that Disney, which owns ABC, was pushing Time Warner to carry new channels and pay higher rates. Negotiations deadlocked, Time Warner pulled the plug on ABC, Disney cried foul to the FCC, both sides compromised (got all that?) and now New Yorkers and Angelinos can watch *Who Wants to Be a Millionaire* again. But for a day, the unthinkable happened: ABC was effectively gone.

Monopoly lesson No. 2: Monopolies swing their weight around — and there's no telling what they'll do when that happens.

And a week before that, instant-messaging

vendor Tribal Voice Inc. filed its own complaint asking the FCC to block the merger of America Online with Time Warner until AOL opens its Instant Messenger monopoly — which Tribal Voice claims is 90% of the market.

AOL says other vendors can connect — but they have to sign a license, as Apple, Lotus, Novell and some Internet service providers have done. And AOL blocks other Instant Messenger vendors from linking up with its systems without paying those license fees — even when that causes problems for its own Instant Messenger customers.

Monopoly lesson No. 3: Monopolies don't like the idea that just because they're so big, the rules are different — or that they can't fight dirty just because they're monopolies.

Maybe these monopoly lessons sound like they don't matter much for corporate IT shops. But they do.

A monopoly could pull the plug on a critical product or service we need — and we'd better be ready.

When monopolies decide to fight, they'll use tactics that are unexpected or even unthinkable — and we'd better be ready.

And when someone tries to get around a monopoly's lock on a product or service, they can expect hardball — and we'd better be ready for the fallout.

Because if we don't have contingency plans, fallback systems and work-arounds, we'll have to run our technology — and our businesses — *their* way. Not for

our customers and shareholders, but for some monopoly's benefit.

And that's not what we're getting paid to do. ▀

Hayes, *Computerworld's* staff columnist, could swear some other monopoly was in the news too, but he can't think who the heck it was. His e-mail address is frank_hayes@computerworld.com.

When monopolies act up, we'd better be ready.



SHARK TANK

CLUELESS IN SECURITY

Sysadmin pilot fish lands great new job. Tells boss and offers two weeks' notice or, "if you want, I can leave sooner." Boss says stay. Next day, fish finds network passwords all changed; his access rights, except those to the Web site, cut off — "Standard damage control," says the boss. Fish offers again to leave. "No," boss says. "You promised two weeks." Postscript: Fish still has complete access to everything via the executive director's passwords — she's used the same ones for years.

CLUELESS IN SYSTEMS IT

consultant pilot fish reading tech monthly finds story about his project for his current employer. In the piece, the CTO crows about a component-based architecture pilot linking the Web site with the mail-order business. Thing is, fish says, mail order wasn't part of the pilot. And the "component" the CTO mentioned is a printer linked to the Web site. Once the order's printed out, it's still entered manually.

CLUELESS IN USERVILLE

E-mail administrator pilot fish e-mails users telling them how to upgrade their messaging software. Instructions include removing old software before installing new. Soon after, help desk is flooded with calls from users "stuck" midprocess. Fish investigates, makes note to self: Next time, change Step 1 to "Print these instructions."

CLUELESS IN PROCUREMENT

User department is having trouble with its portable printers. Management dispatches troubleshooter pilot fish, who quickly pinpoints the problem: User application is set up to use only the protocol for IBM printers. Meanwhile, the user department equipped the entire field staff with new printers without testing them or even asking IT's opinion — printers that understand only a Hewlett-Packard printer protocol.

Happy ending: The nice-guy fish sneaks a change into the application to solve the purchasing snafu.

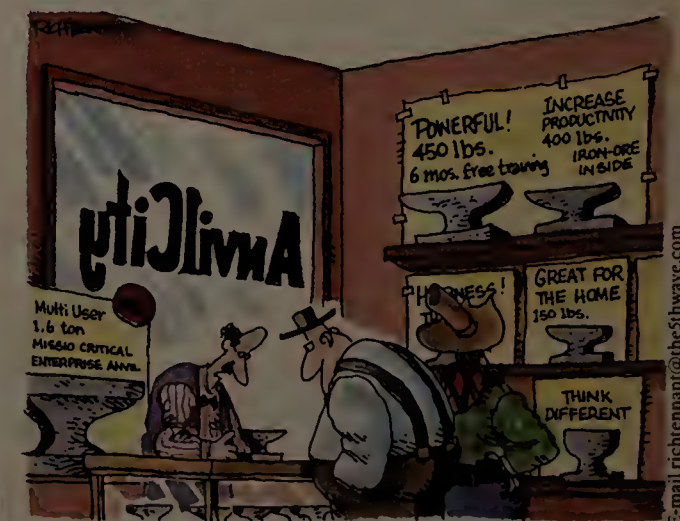
CLUELESS IN LOVE

This pilot fish is one of many at his company who gets a penitent message last Thursday from Zona Research, apologizing for accidentally sending copies of the "I Love You" virus to all of its clients. OK, says the fish, except that shortly after that he gets two new messages from Zona, each containing the VeryFunny.vbs variant of the same virus.

Analyst outfit IDC also got whacked by the virus and sent a warning message to its clients. But the warning ends in mid-sentence: "Please contact the sender to get a cle."

Hey, forget the cle — contact Sharky with true tales from IT and get a sharp Shark T-shirt: sharky@computerworld.com. And do a deep dive daily at computerworld.com/sharky.

The 5th Wave



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